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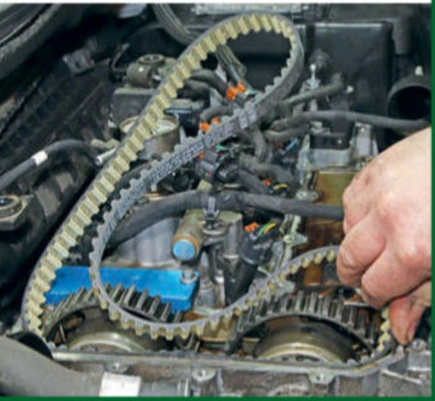
2 PRIZES WORTH OVER £611

TIMING BELT

PureTech Wet Belt

1.2 turbocharged 3-cyl



ALTERNATORS

DISCOVER HOW MODERN UNITS WORK

- ✓ Alternator testing
- ✓ The auxiliary drive belt
- ✓ Mild Hybrids & Belt-Driven Starter Generators
- ✓ 43-step guide to remanufacturing an alternator
- ✓ 5 TOP TIPS to getting cash for your old alternator

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DIAGNOSTICS

Peugeot 207 CC

1.6 petrol non-turbo

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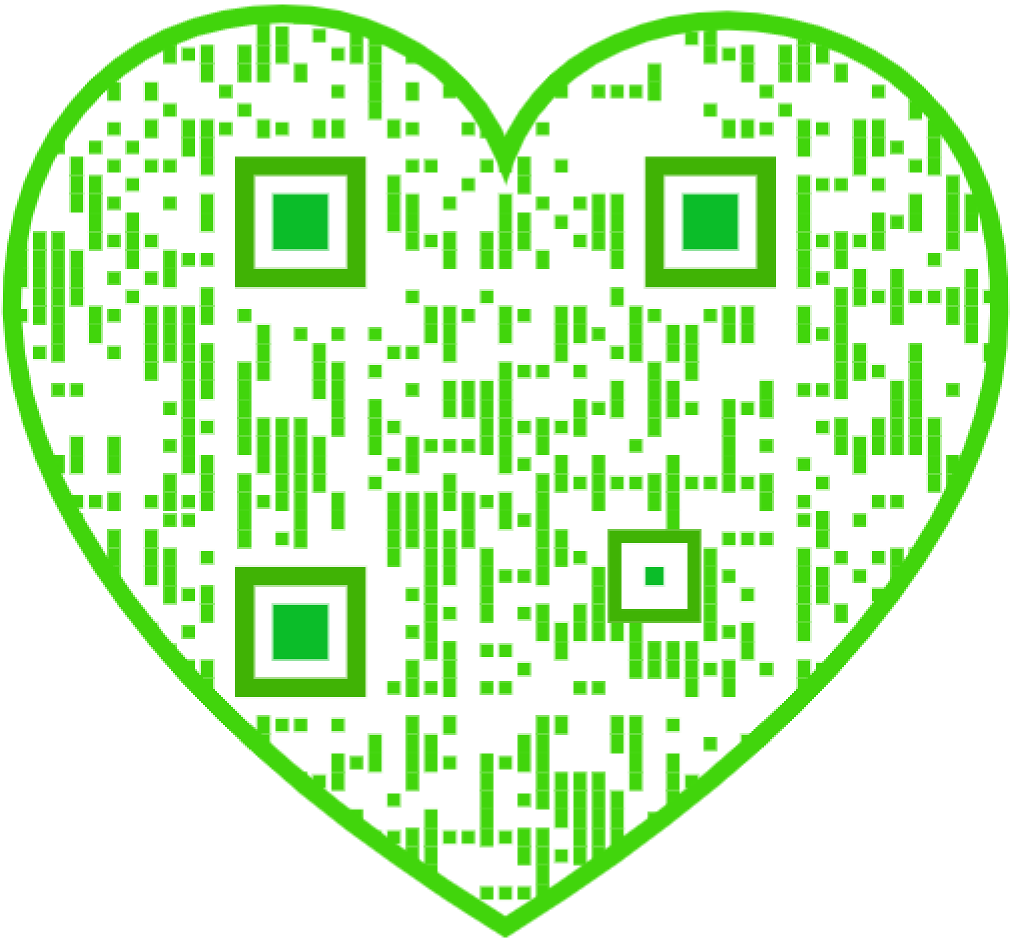

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Wet belt theme

Here we go again... the subject of belt-in-oil (BIO) timing belts is always on my mind of late. Mainly because I bought a vehicle with the PureTech turbocharged 1.2-litre 3-cylinder. Why, you may ask? Well, I thought it would OK, even though, deep down, I knew it wouldn't! Even Mr Humble is talking about BIO engines on page 114.

The Peugeot 208 PureTech non-turbo 1.2 that we changed a wet belt on in the September 2024 issue was written off by the insurance company after it first hit a deer, then a few months later, a dog. For some reason unbeknown to me, the insurance company put a Cat S marker on it. Cat N would be more appropriate. Anyway, that car sold at Copart and has recently passed a MOT test.

The family member owner of the 208 gave me a list of cars to look out for as a replacement for the 208. The specifications simple – 1.4-litre or less, petrol and a boot bigger than 311 litres. I added my own suggestion to the list – a slightly larger version of the 208, the 2008. Family motoring at its best. Not!

I was out just before Christmas playing ten-pin bowling – it was nearly 10pm on a Saturday when my mobile pinged – YX16 ZJY was about to be sold by BCA. Yes it was late, yes I'd had a few jars. It seemed cheap at £3300 + fees – it was mine. Back to bowling.

Timing belt issue

From the Assured Report (additional £56) that BCA had attached to this Peugeot, all was OK, except I may have missed the small print saying, "timing belt issue". Rubbing my eyes on Sunday morning, I thought to myself, oh well, it will need a belt change anyway at the indicated 64,285 miles.

I had the 2008 transported to Mark Shipman at AES York (from the sale point at BCA Nottingham). Mark would be the man to fix it. With fees and transportation, the price was now near £4000. Even with Mark's generous labour rates to me, the belt change came to over £700. You can read the BIO report from page 40.

The 2008 looked in remarkable condition from the BCA report – the exterior had minimal blemishes, the interior clean. Three former owners and seven stamped services in the book. However, the previous owner had missed the last annual service by about eight months, although the mileage was within the 12,000-mile service interval (just). With other engines you'd probably be fine in this situation, but with a BIO engine not so.

The timing belt renewal has for this 2016 built car changed from 112,000 miles (or 10 years) to 60,000 (or five years), I believe. With a belt 'check' every 16,000 miles or 12 months. To be honest, it's so confusing depending on what year your engine was built, it's probably best to pop into the Peugeot main dealer to ask them for the latest update.

Anyway, Mark did the work on the engine and Rob Hawkins helped in other areas. The brakes all-round needed replacing. And the rear calipers didn't look in the best of health, so they were renewed with febi units. Then we found the brake hoses attached to the rear calipers rusty and they should be renewed (and they were). Plus, the exhaust was in a bad way. Someone had bodged a repair where it meets the catalytic converter. The whole exhaust was past its best at 64,000 miles – all before its 9th birthday. Brilliant! However, there was more trouble ahead...

Although Rob and Mark had done some great work on the 2008, I hadn't seen it with my own eyes. When Rob went to put the newly-arrived brakes into the boot area, he called me to ask if, when sold, the Peugeot had a parcel shelf and boot carpet. Looking at the sale images, yes it did. Except now it didn't! I contacted BCA the next day. They were really helpful and acted on my queries. Two days later BCA had worked out what had happened. Apparently YX16 ZJY was sold to a punter in November. They took it away from BCA Nottingham and then contested the Assured Report. The buyer returned the 2008 to BCA with 58 miles added to the clock (hence why the fuel level was lower than shown in the images) and the boot items were probably 'lost' at the same time. BCA forgot to reappraise the car with new uploaded images on that Saturday night sale.

I also contested the exhaust leak as on my Assured Report it said it was OK. In the end BCA refunded me over £600 for missing items (and the exhaust).

At the end of March, I managed to get a train up to York to see the 2008 for the first time. Offering to take Mark and Rob out for some pub grub as a thank you, we drove down an unmade road. On our return the 2008 didn't like the rough surface and consequently lit up as many lights on the dash as it could relating to an ABS fault. They didn't go out either after restarting the engine. 300 miles home with those lights shining at me. I fitted a new nearside front ABS sensor. All good, except the TPMS was still showing as faulty. I had to drive a bit further and, on my return, turned off the ignition, waited 30 seconds and back on. The TPMS light went out. Perfect. Although, once on the MOT ramp, would you believe it, the TPMS came on again!

Would I buy another Citroën/Peugeot under 10-years-old with a wet belt? Probably not!

£54
NOTICE
YX16 ZJY

Even with all the prep work done on this Peugeot 2008 over the past few months, it still failed its MOT. Once I've finished writing this, I need to raise the car to tackle the repairs before the 10-day retest expires.

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We are sorry, but apart from material sent to *Help!* or *Diagnostics Doctor*, not all correspondence can be replied to personally, though everything is read carefully. Emails will be treated in the same way as ordinary mail – the editor is not normally available to provide instant replies.

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The Peter Simpson COLUMN

Peter was caught speeding, so had to do the course...

▶ Ladies and gentlemen, I have a confession. Back in December, I was caught by a speed camera doing 35mph in a 30. It was 100% my own fault; I even knew there was a camera in that location! My only defence was that the car I was driving was a recent acquisition, and I was therefore not yet used to how it felt at different speeds. That's no excuse though, a driver should use a speedometer to tell the speed at which he is travelling. So a totally 'fair cop'.

As the car in question was still registered in trade at the time, it took a little while for the paperwork to reach me, but when I did I sent it back, admitting my sin, and a couple of days later came the hoped-for offer to attend a three-hour speed awareness course as an alternative to three points/£100 fine. The courses are available for offences committed in England, Wales and Northern Ireland – they are not yet offered if you're caught speeding in Scotland, and there's a choice between doing it online and in person; I chose the latter, and a few days ago, presented myself at the Peterborough Holiday Inn for my course.

Most of us were of 'a certain age', and of the 24 people on 'my' course, 19 were male. One posh-sounding lady in designer clothing seemed determined not to communicate with anyone else, but the rest of us were soon talking, and for most of us it was a similar story; mobile or fixed speed camera, 35-39 in a 30 or 46-50 in a 40. However, one poor chap had been caught by the same camera three times in two hours, and though all three incidents were within the parameters for a course, you can do only one course in three years. So he got the course plus six points.

At the appointed time, we were shown into the training room sat in groups of six. Our trainers John and Helen introduced themselves, and after checking driving licences etc., the course began with a Q and A about what speed limits applied to what roads. Not everyone got these right; the limits are 30mph anywhere with street lights, 60mph on single carriageways, 70mph on dual carriageways and motorways unless signs say otherwise. Except, of course, in Wales, where the default street light limit is 20mph. The difference between 20mph streets and 20mph zones in the rest of Britain was also explained; in a 20mph zone the limit applies not just to the road you are on but also to any that lead off it, until you pass a sign indicating its end. In Scotland, there's currently a proposal to reduce the single carriageway limit from 60mph to 50mph but that is yet to become law.

We then moved on to look at why people speed, and the effect of doing so. I should stress at this point that the whole approach was positive and friendly; there wasn't the slightest element of telling-off or preaching, and participant involvement wasn't just welcomed, it was actually expected and a requirement of completing the course. There is, however, no pass-or-fail element to any of this. All you need do is attend throughout the course (with a pen and paper), take part and not be disruptive.

Some of the facts and figures presented were certainly thought-provoking. For example, although road accident deaths and injuries have basically been static or in decline for at least ten years, there are still around 1800 deaths, 29,700 serious injuries and 126,000 slight injuries a year – that deaths figure equates to nearly five a day. We also saw a video showing the effect on overall stopping distances of exceeding a 30mph speed limit by just 3mph; it was jaw-dropping and intended to be. We also looked at just how much time a bit of speeding saves – 80mph on a motorway instead of 70mph saves you six seconds a per mile covered, so doing it for ten miles saves you a full minute – wow!

One thing that I wasn't expecting however was the inclusion of some calming techniques; speeding often results from people feeling stressed and/or preoccupied. One simple one which I'd like to pass on was the 'five second triangle'. All you do is breathe in for five seconds, hold your breath for another five, and then breathe out for a final five. Try it, it does seem to work. John asked if other participants have any ideas for calming techniques; my suggestion was to retune to Radio 4, though on reflection Radio 3 might well be a better choice here…

During the 15 minute comfort break, most of us had a further chat, and it seemed that we all had much in common – in fact it turned out that the guy two seats away to my left was a fellow Volvo C70 owner, while the chap to my right owned several MGBs. There were also a few professional drivers. We all, however, had been driving for 30plus years, and in most cases not undertaken any driver training (other than speed awareness courses) since passing our tests. That test-pass was when cars, driving techniques and road traffic laws and the test itself were very, very different from today.

I can't help but wonder whether this is part of the objective of courses like this; to get people whose driver training could, perhaps, do with updating, back into the classroom. If so, then that's an excellent idea. The major incentive, though, is avoiding penalty points; it's also now been confirmed legally that participation in a speed awareness course does not need to be disclosed to an insurer unless the question is asked specifically. As I understand it, that normally happens only if the driver is high-risk for some other reason, such as a relatively young person wanting cover for a high-performance car.

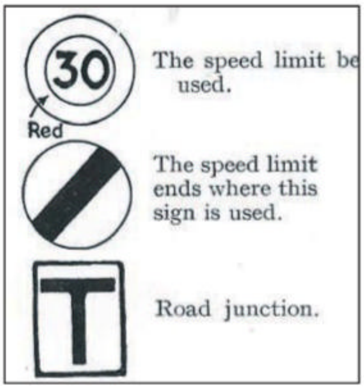
Overall, I'm glad I chose the course; it was informative and interesting, and if I got something out of it, then chances are you will too if it's offered. It did, however, remind me of one aspect of Britain's road signs which I think needs amending. I'm talking about the black stripe in a circle 'national speed limit' sign. This is one of the few road signs from the pre-Warboys era that's still in use, and until the 70mph limit was introduced in 1964, it meant 'speed limit ends'. Psychologically, a black band in a circle still, I'd argue, indicates that a regulation is being relaxed or removed.

Except that since 1964, it hasn't meant that at all. Rather, it now indicates that one speed limit is being replaced by another.

But that new limit varies according to the type of road; it's 70mph for motorways and dual carriageways, but 60mph for single carriageways and in due course it might mean 50mph on single-carriageways in Scotland.

Is this particular sign, and having it indicating two different figures, contributing to people's confusion over what limit applies where? It was certainly the difference between single and dual carriageways that most people got wrong on my course. Is it, therefore, perhaps time for this old stager to be phased out in favour of the figure-in-a-red-circle limit type signs which show the actual speed limit in figures? This need not happen overnight; just replace the signs as they come up for renewal and/or road layouts change?

Something for the authorities to think about perhaps?



The speed limit be
used.

The speed limit
ends where this
sign is used.

Road junction.

Road signs information from an early 1950s driver training book, showing the original meaning of the 'national speed limit' sign. Is it now time for it to be retired?

INSTANT EXPERT

Follow Rob on X: **#CarTechJourno**

Alternators

With the proliferation of modern car electronics, the poor alternator has its work cut out, leading **Rob Marshall** to look at how remanufacturing them is a vital means of benefiting your wallet and the environment, without sacrificing quality.

A modern engine would not even run without sophisticated electronics and most car buyers would not consider models lacking power-sapping comfort and convenience accessories. Yet, the electrical energy has to be generated from somewhere and this is where the alternator steps in.

Despite its relative sophistication, the alternator relies on the same electromagnetic induction working principles as its forebear – the humble generator/dynamo. When its rotor was spun inside a set of static magnets, electrical power was generated within the coils of wire within the stator that surrounded it. The resultant Direct Current (DC) was used to charge the battery and power rudimentary electrical accessories.

Without a reliable and efficient means of producing electricity, the modern motor car would be very different.

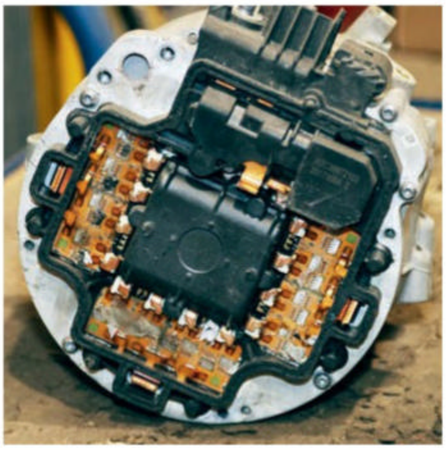
Unsurprisingly, the simple dynamo had its drawbacks, chief among which was its output being related directly to rotor speed. Motorists, therefore, had become accustomed to keeping a close eye on their ammeter instrument gauges (which were also popular aftermarket fittings) and revving their engines in traffic at night, to prevent their battery from being discharged, while the headlamps were on.

The development of electronics and, specifically, the transistor's introduction, saw alternators replace dynamos on most popular cars during the 1970s. It shared the same working principles as the dynamo, retaining both a rotor and stator. However, the electrical current output could be varied and made less dependent on rotor speed, by introducing a voltage into coiled wires within the rotor, which increased the magnetic field's strength and, therefore the current generated within the stator's windings.

As its name intimates, the alternator produces alternating current (AC), compared with the dynamo's DC, which has no practical use. Therefore, a rectifier was added, containing semiconductor diodes, ensuring that current can flow in one direction only and, therefore, convert AC into usable DC.

When returning your old unit, do not forget to remove any ancillary parts, such as fitting spacers and brackets, because a remanufactured alternator is unlikely to include them.

All alternators produce heat but some of them create so much that they require water cooling and so ports are provided. Checking for leaks at service time is a wise idea.

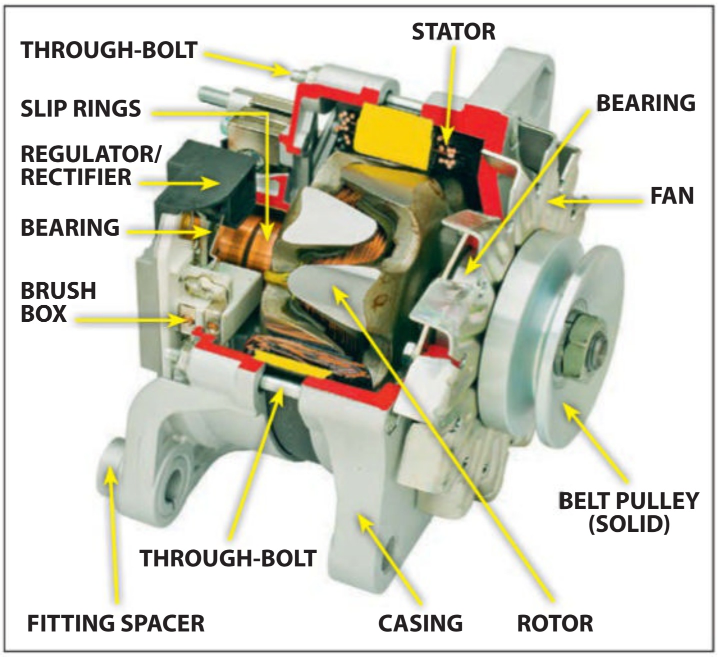

The alternator's electronics are behind the rear cover. These vary from simple rectifiers and regulators to more complex controls, as pictured on the rear of this Mild Hybrid BSG.

How alternators work

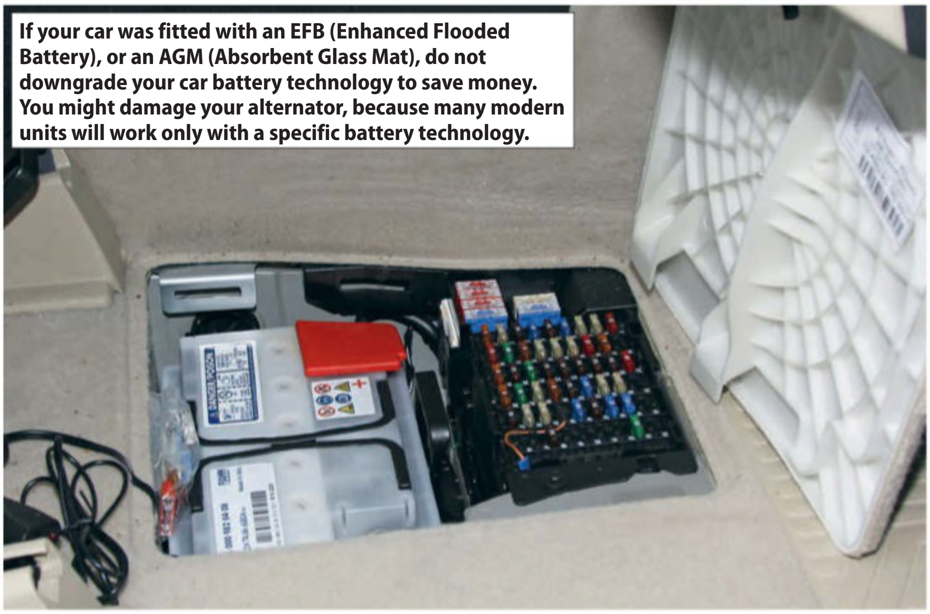
▶ The alternator is bolted and earthed to the engine, powered by the Front-end Auxiliary Drive (FEAD) belt. The pulley may, or may not, provide a fixed drive to the rotor. The rotor is a shaft, supported by two bearings at either end, containing two sets of coiled wire to which voltage is applied to vary the magnetic field and, therefore, control the output generated within the stator. The stator is mounted within the alternator's casing and comprises three sets of wire coils. The current generated within these three phases depends not just on the voltage applied to the rotor but also the rotor's speed. Should the rotor speed be low, more voltage can be applied to the coils, thus maintaining output at engine idle.

Each phase is connected to the rectifier unit, which employs diodes to convert AC to DC. A voltage regulator might feature, to control power directed to the rotor. This is not present on Smart Alternators. Instead, a communication wire/plug is provided to promote communication between the engine management system and the alternator.

The battery warning lamp's importance tends not to be appreciated. On many cars, the lamp forms part of the circuit. Should the bulb fail, it is possible that the alternator will not produce any useful usable output. Check that the lamp illuminates with the ignition switched on, and extinguishes very soon after the engine starts.



If you conduct multiple short trips, consider upgrading to a battery with a higher CCA (Cold Crank Amps) figure and maintain a voltage of at least 12.4 volts.
VARTA
E44
77Ah · 12V
780
577 400 078
SILVER dynamic
Johnson Controls


If your car was fitted with an EFB (Enhanced Flooded Battery), or an AGM (Absorbent Glass Mat), do not downgrade your car battery technology to save money. You might damage your alternator, because many modern units will work only with a specific battery technology.

Keeping control

Both dynamos and alternators need their outputs controlled, if anything, to avoid overheating batteries and causing electrical fires. Some dynamos used to employ separate regulator boxes, which required periodic adjustments at service time. Traditionally, alternators contain regulators that monitor battery voltage and vary alternator output, by manipulating the voltage applied to the rotor. Modern smart alternators do not possess internal regulators. Instead, this task is conducted by the engine management, which includes the Battery Monitoring System, with most types featuring a chip that is attached to the negative battery terminal. The BMS considers other factors other than battery voltage alone, including engine coolant temperature, engine load and throttle position.

The repair proposition

To deconstruct alternators not just physically but also technically, we turned to Autoelectro, the largest privately-owned rotating electrics firm remaining in the UK. Over three generations, the family owners have evolved the company not just to prioritise value for money but also the quality of work, availability and technical advice. It also has invested heavily in keeping up with Mild Hybrid technology and can provide remanufactured Belt-driven Starter-Generators (BSGs), saving the car owner many hundreds of pounds.

Autoelectro highlights that remanufactured alternators are very different to units that have been repaired, or even reconditioned. Every viable unit is inspected, disassembled, cleaned, tested and the main electrical control units, i.e. the rectifier and regulator, are replaced with Original Equipment (OE) quality parts, regardless of their condition. Yet, because the main stator, rotor, casing and plastic mouldings are retained, customers will save money, while being reassured that the remanufactured unit will last at least as long as a new component from a main dealership. When compared with a new OE item, independent life cycle analysis indicates that a remanufactured alternator will save around 80% CO2, require 80% less energy and use 90% fewer materials. For more information about remanufacturing generally, check out **www.remanufacturing.eu**

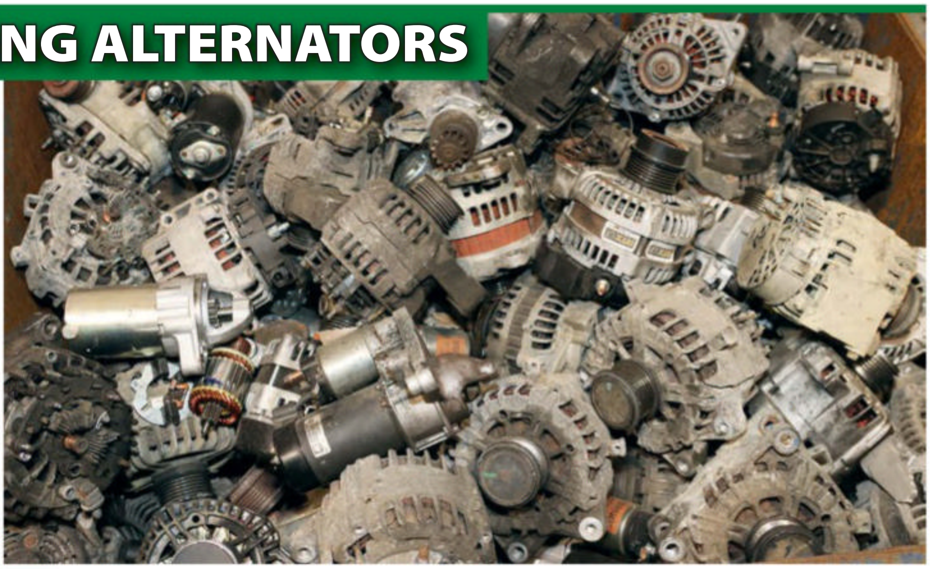
ROB'S TOP TIP

Never disconnect the battery, when the engine is running.

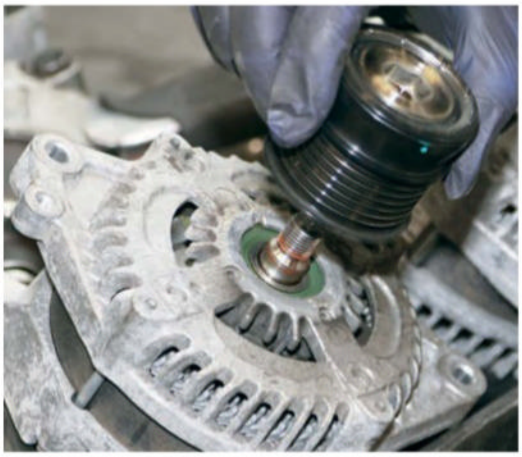
As the following procedure shows, alternator remanufacturing is a skilled and labour-intensive process. Yet, detailed knowledge of the various procedures, coupled with decades of experience, have seen remanufactured alternators being at least as good as a new OE-quality unit but offered at a fraction of the cost.

REMANUFACTURING ALTERNATORS

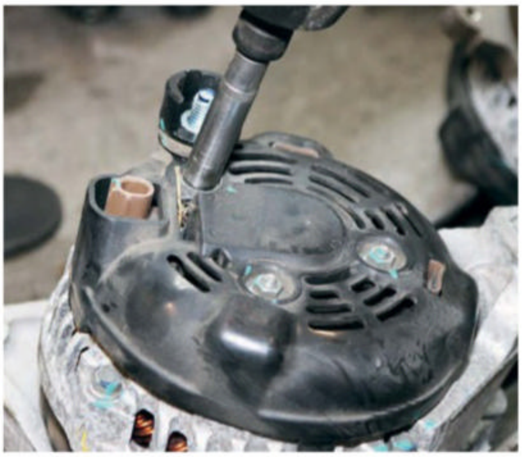
1 Old items ('core') are central to the remanufacturing process, which is why Autoelectro verifies that not only the correct part is returned but also that its casing is inspected carefully by a qualified technician for damage, excessive wear and any other defect that would make it unsuitable for remanufacturing.



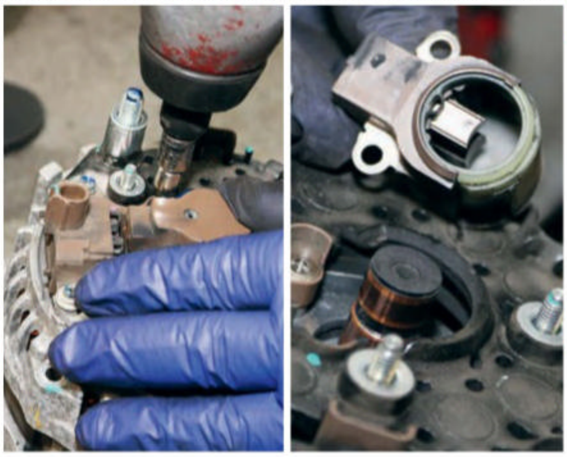
2 As detailed elsewhere, most reasons for rejection are down to careless removal. Should the part be unsuitable for remanufacturing, it is consigned to the scrap bin and the customer's surcharge is not refunded, with the customer's acknowledgement and agreement.



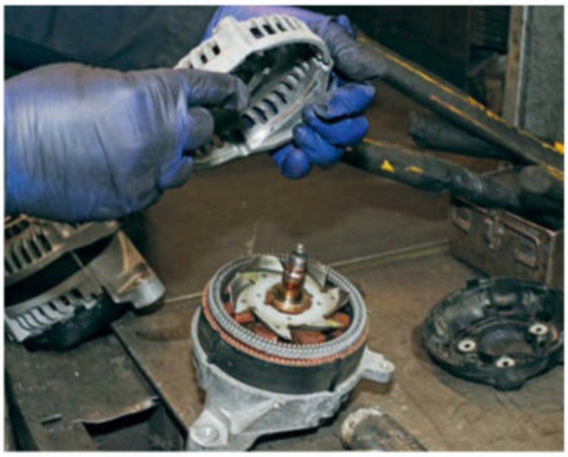
3 ◀ After inspection, the remanufacturing process commences, which Autoelectro performs in batches, a technique known as Group Technology. The disassembly process commences with removing the drive pulley. Should it be of a solid design and in good condition, it is retained, cleaned and painted, prior to being refitted, later. As pulleys with clutches have a finite lifespan, they are discarded, because new replacements are fitted.



4 ▶ The plastic rear moulding is also removed and retained. On this Honda unit, it is retained by three screws.



5 ◀ The brush pack is removed and discarded, because a new moulding is fitted that contains new carbon brushes. The retaining screws are re-used, however. Some brush packs incorporate the regulator, which is another reason why it is renewed.



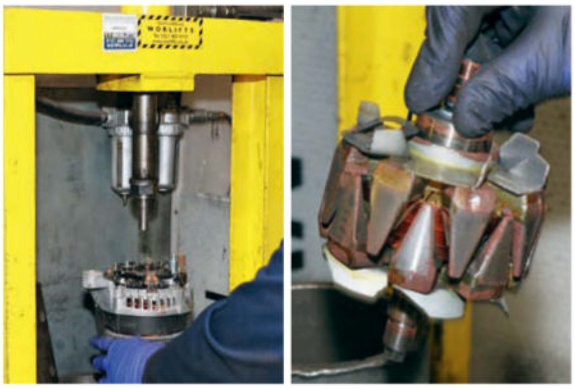
6 ▶ The through-bolts are removed that hold the two halves of the alternator casing together, allowing them to be separated.

Look after your battery and it will look after your alternator

▶ As high temperatures are anathemas to electronics, Autoelectro's assertion that the main killer of alternators is heat comes as little surprise. The main reason why alternators overheat is when they are faced with a discharged battery. This is because they have to produce more current and this leads to their internal temperatures increasing.

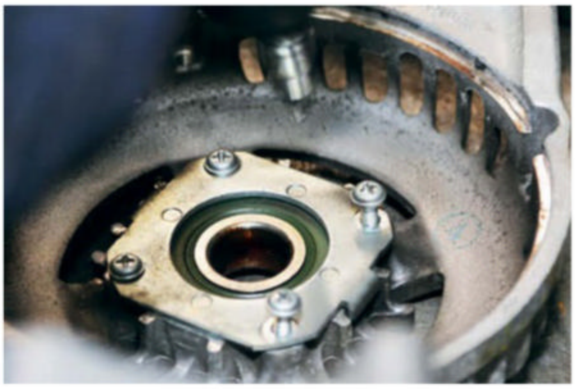
Should you want your alternator to last, keep your battery state of charge as close to 100% as you can. You can do this, by using a mains-powered smart charger. These will top up your battery, without overcharging it. It may come as some surprise that not only Autoelectro but also battery manufacturers have told us that an alternator is not designed to recharge a battery fully. One reason for this is that lead-acid car batteries are intended to be discharged heavily and quickly but recharged slowly. This is why recharging a 'flat' battery with a smart charger can take overnight, at least. Additionally, it tends to take up to twenty minutes of driving to replenish the energy taken from a battery to start a cold engine. Therefore, should your trips comprise only several miles, your battery can suffer from voltage walk-down. Once your battery state-of-charge drops below 12.4 volts, various chemical reactions occur internally that result in sulphation. Ultimately, sulphation robs the battery of its capacity.

When considering battery condition, therefore, consider two main parameters: state-of-charge (measured in volts) and state-of-health (measured in amps). While recharging can restore the state-of-charge, there tends to be little you can do to restore the state-of-health. One reason for this is that the acid solution inside the battery will, eventually, corrode the lead paste on the plates. This is why lead-acid car batteries have a finite lifespan, no matter how well they are looked after. It is possible, therefore, to have a fully-charged battery but with such a low state-of-health that it is unable to start the engine.



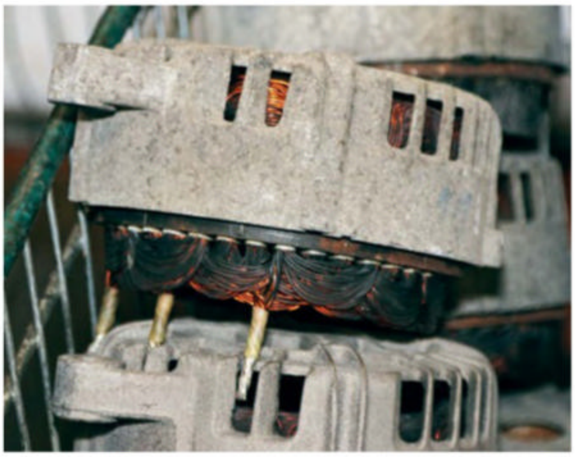
7 ◀ **An hydraulic press is employed that pushes the rotor from the alternator bearings squarely, so that no parts are damaged.**

8 ▶ **Some alternator casings possess a bearing plate, which must be removed to allow access to the bearing. This part is retained for later, along with its fixings.**



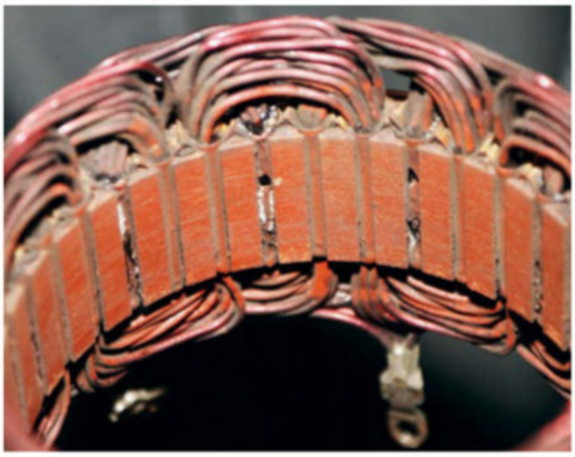
9 ◀ **The bearing is then knocked from the casing and discarded. Some bearings may remain on the rotor, which are removed later. See Step 16.**

10 ▶ **The rectifier is separated from the stator and discarded. The stator's wire ends, from each coiled wire circuit ('phase') are exposed, so they can be tested.**



11 ◀ **Testing ensures placing each phase under load. The technician checks that the applied current can be held and that each phase, along with the insulation, is intact.**

12 ▶ **Visual stator inspections are also important. The corrosion in this phase indicates that the insulation has been breached and is unsuitable for reuse. Sure enough, it failed the electrical test.**

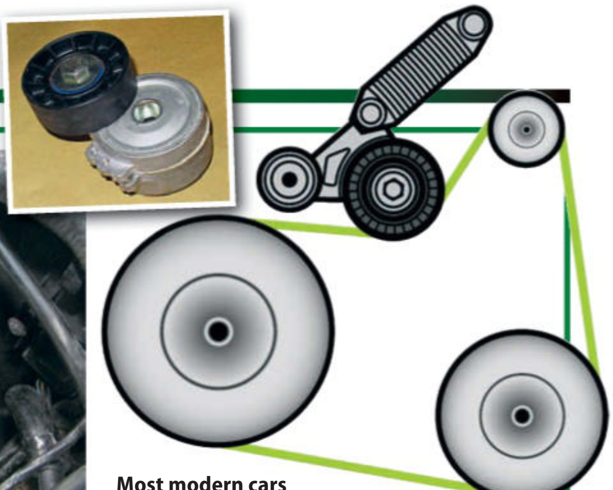


The auxiliary belt drive

▶ Should your alternator struggle to maintain a healthy output, consider when the front belt auxiliary drive (FEAD) assembly was maintained last, because it tends to be forgotten. As alternator demand increases, its pulley becomes harder to turn and this places more stress on not just the belt but the whole FEAD system, including tensioners. While modern, multi-ribbed belt designs provide a large surface area, you will experience slip, should the belt be contaminated, worn, the tensioner weak, or any rollers seized. Symptoms of this include a high-pitched squeal and/or black rubber dust in the vicinity. This is why you should consider the health of the whole FEAD system and not just the belt. It also explains why quality suppliers provide complete FEAD kits – just like a timing belt.

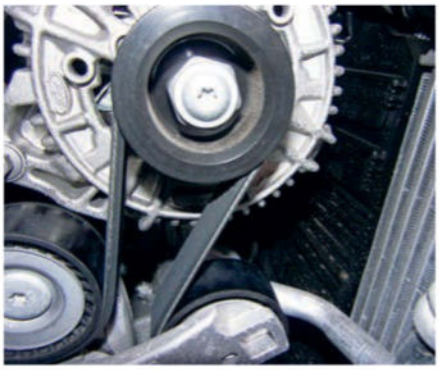
The problem is that, unlike the timing belt, few manufacturer service intervals specify FEAD replacement intervals. A useful guide is to check the FEAD at 60,000 miles and renew everything at 90,000 miles. Yet, Autoelectro warns about the proliferation of low-quality parts, especially on online marketplaces. The firm says that it has found instances of belt tensioners, which are not made by reputable manufacturers, not exerting sufficient tension on the belt, which causes slip and a subsequent low alternator output.

The old way of ensuring belt tension was to adjust the alternator's position on its mountings. This tended to lead to the belt being overtightened, which placed excessive lateral strain on the alternator's bearings.



Most modern cars possess a spring-loaded automatic tensioner, such as that pictured. It allows the prescribed tension to be applied and maintained. To check if it is working properly, verify that the belt does not oscillate excessively, when the engine is idling.

If still visible, note any ID on the old belt, when you remove it. The numbers on this conventional belt identify it as 1217mm long, with six ribs. Extra letters detail special constructions and materials, which is more likely on newer cars.



Belts for Mild Hybrid BSGs, which have to tolerate torque in different directions, tend to possess special coatings and an internal heavy-duty construction. The tensioning arrangements differ, too. Note how the roller/tensioner mechanisms on this Ford Puma MHEV are positioned very close to the BSG to maintain belt tension in both directions.

13 ◀ The metal parts, including the casings and stator windings, are steam cleaned and then degreased within a solvent bath. These processes are tough enough to remove deposits but do not attack insulation wiring.

14 ▶ To remove surface corrosion and to ensure an 'as-new' finish, the outer casings are bead-blasted manually.

15 ◀ Ancillary parts are inspected carefully, to verify that they meet Autoelectro's high reuse quality standards. Should they pass, they are painted. Such components include external fans, plates and solid pulleys.

16 ▶ Work begins on the rotors, by removing any old bearings with a special press. This unit had a damaged bearing plate, which was removed and replaced later.

Continued on page 12

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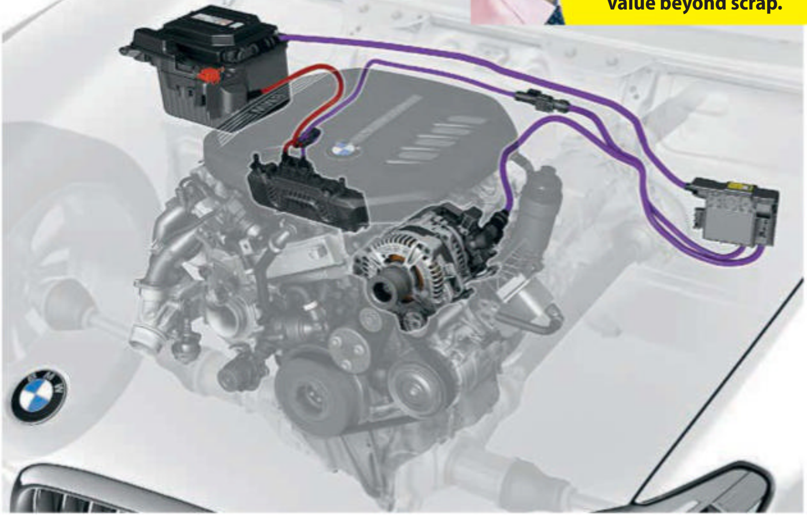
ROB'S TOP TIP

Your old alternator has value beyond scrap.

Mild Hybrids & Belt-Driven Starter Generators (BSGs)



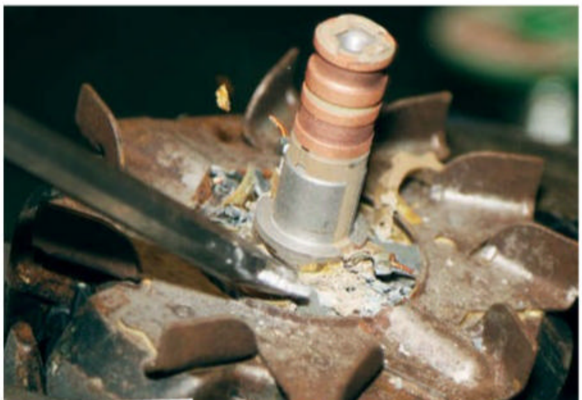
▶ While alternators have not changed significantly, the need to make combustion engines more fuel-efficient and produce less carbon dioxide accelerated their development. The reason for this was that manufacturers realised that electrification was the only possible way to achieve these legislative goals.

Mild Hybrid Electric Vehicles (MHEVs) meet these targets cost-effectively, by combining an engine start/assistance function within the alternator. These units are known officially as Belt-driven Starter-Generators (BSG). They do not quite take over the role of the traditional starter motor, because the separate starter motor is still fitted, for high-torque cold-starting duties. Yet, the BSG's starter function tends to be employed, when the Stop-Start function is activated, such as in heavy traffic. Compared with using a pre-engaged starter motor, the BSG provides quicker and smoother starting under these conditions. Most cars employ a separate battery, using lithium-ion chemistry, which is designed to last as long as the car.

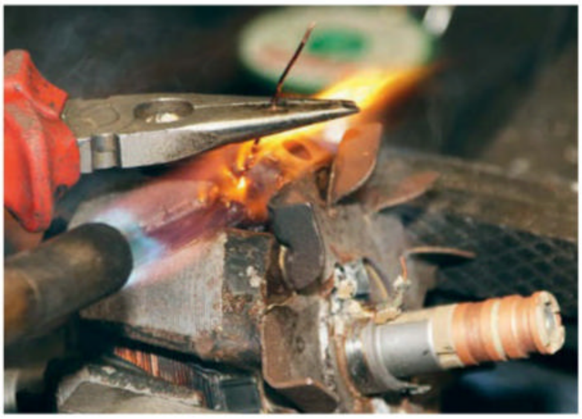
The majority of MHEVs cannot move the vehicle with electrical power alone. Instead, the system assists the combustion engine. Most MHEVs use a 48 volts system and a separate lithium-ion battery pack. In this BMW example, the DC/DC converter, or the Power Control Unit (PCU), in BMW's parlance, acts as an interface between the 48 volts electrics and the 12 volts system. This allows the 12-volt battery to be recharged via the PCU and not directly from the BSG. Naturally, the PCU and engine ECU communicate to regulate and distribute voltage throughout both circuits.

As with a smart alternator, the load on the drive belt is varied, according not just to battery state-of-charge but also driving conditions, for maximum fuel efficiency. BMW uses the BSG to assist the engine, under a condition it calls, 'eBoost', which is when the BSG supports the engine with extra torque to reduce lag, while the turbo pressure builds. The BSG can also support the engine under full turbo boost for extra power, which BMW calls, 'eOverboost'.

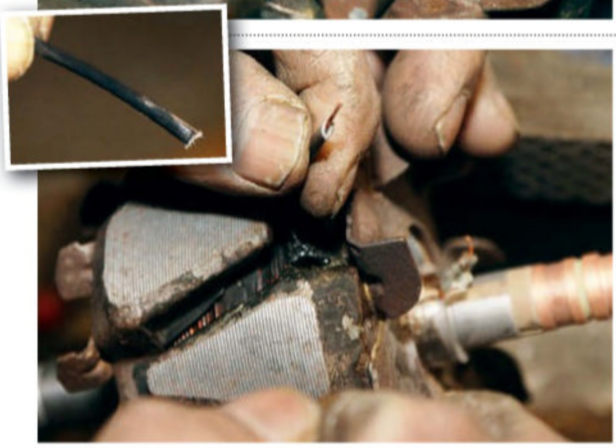
Despite the best efforts of car manufacturer marketing departments to make them sound super-sophisticated, MHEVs offer a relatively simple and inexpensive means of electrification. For DIYers and repairers, they do not require specific high-voltage training, because 48 volts tend to be insufficient to overcome dry human skin's natural resistance. Even so, the system should be treated with respect, especially as BSGs are high-value items.



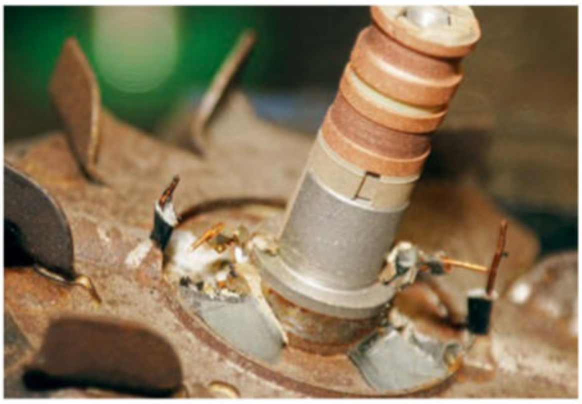
17 ◀ **The glue that protects the wire leading from the slip rings to the stator is chipped away on both sides as much as possible, before the wires between them are cut.**



18 ▶ **To free the stator wire, the area is heated with a blow lamp, which melts the glue sufficiently, so that the wire can be pulled free.**



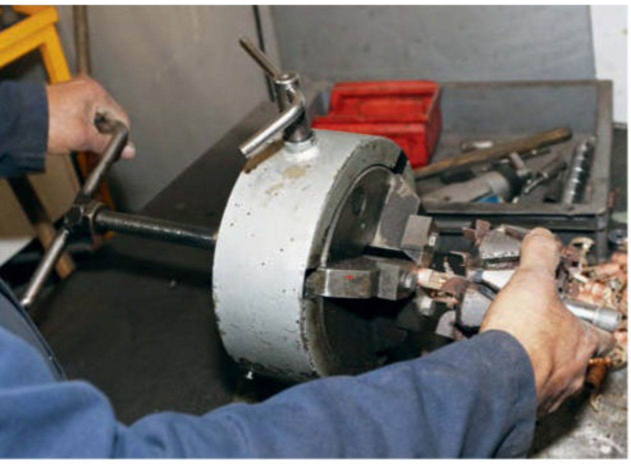
19 ◀ **The downside is that the heat damages the wire's insulation, so a replacement piece is cut to size and placed over the exposed wire.**



20 ▶ **This is fed back into its cavity, within the steel pressing. Note how the brushes have worn deep grooves into the copper surfaces of both slip rings.**

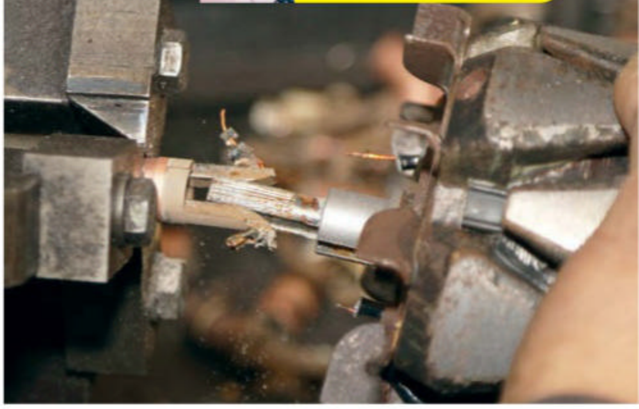
ROB'S TOP TIP

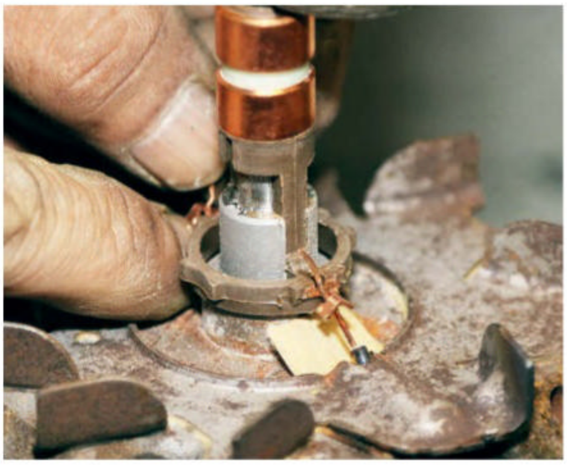
Take care, when removing and refitting your alternator.



21 ◀ The slip ring is removed, using a special jig, which...

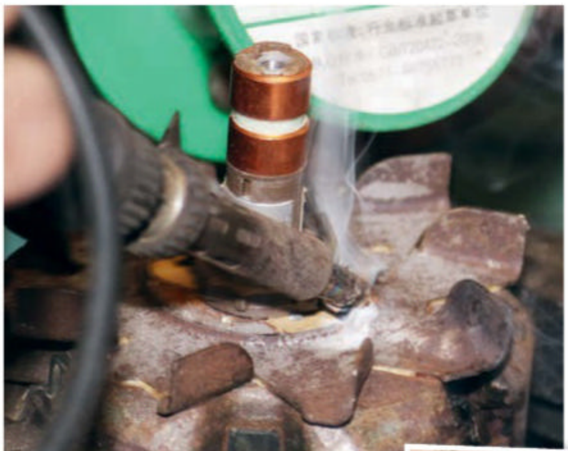
22 ▶ ...pulls the slip ring assembly from the rotor's shaft, before a new slip ring is pressed into position.

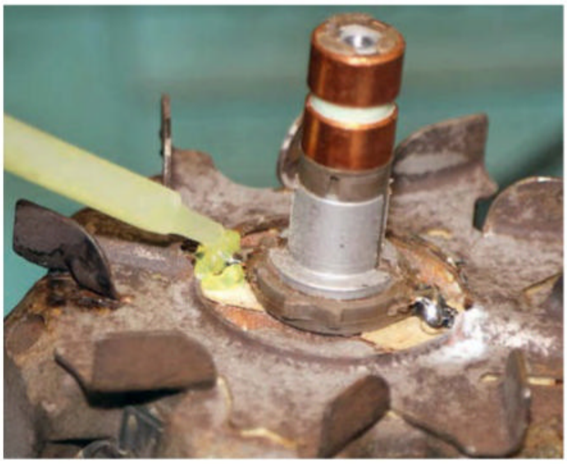




23 ◀ New replacement card insulators are fitted, before the wires are connected to their appropriate slip ring.

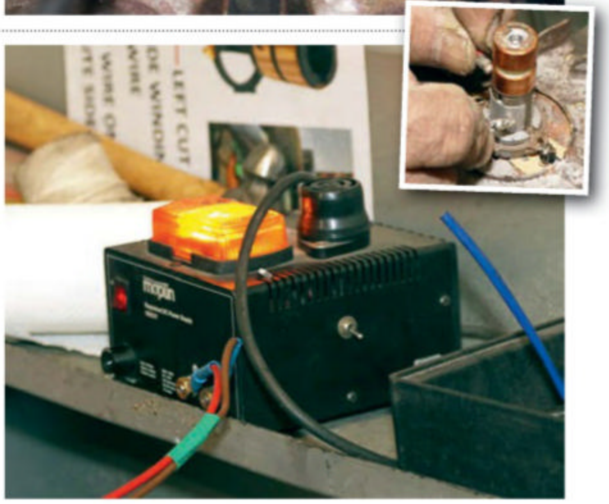
24 ▶ These connections are then soldered to fix them into place.

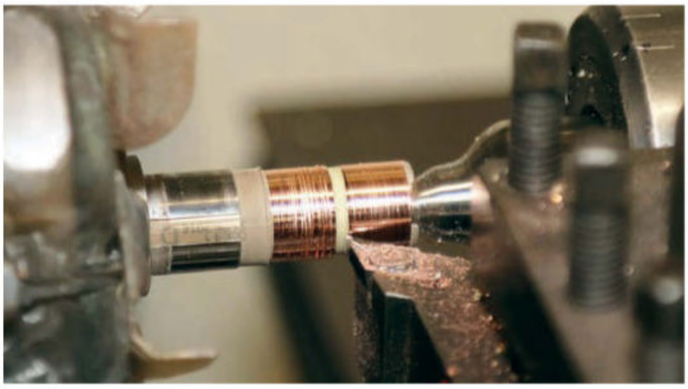




25 ◀ The wires are then glued not only to prevent them from vibrating and breaking but also to prevent any short circuit risk.

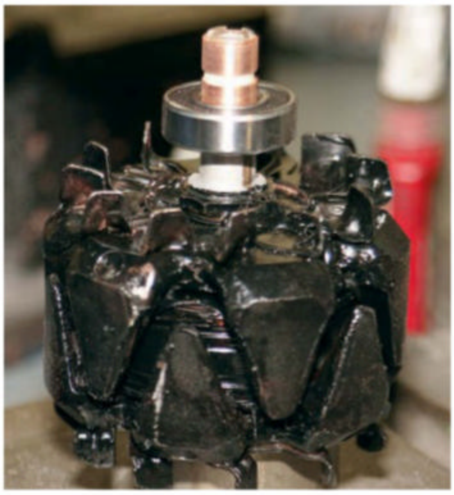
26 ▶ The technician performs a simple connectivity test, to ensure continuity between the slip rings and the rotor assembly.





27 The slip rings are balanced, using a dedicated lathe to ensure that they run true. This reduces the vibration risk, which will curtail the alternator's lifespan. The slip rings are then covered to protect them as they travel through the production process.

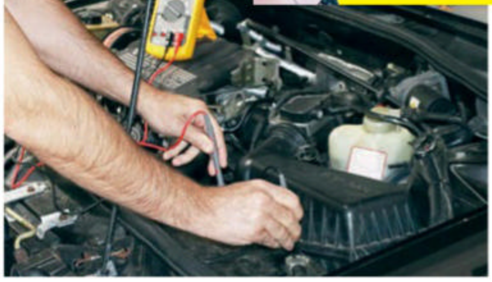
28 ▶ The rotor is painted, prior to replacement bearings being fitted. Autoelectro reports that it upgrades bearings, where they are known to be a common failure point. This is one way in which remanufactured parts can be claimed to be superior to a new replacement.



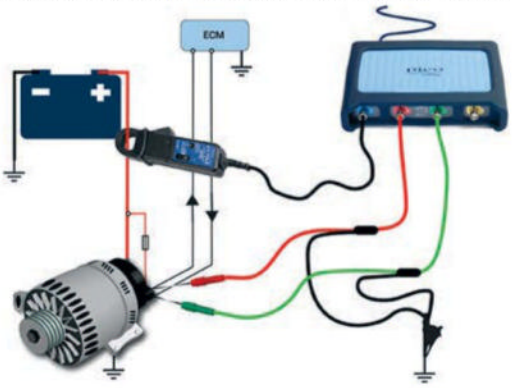
ROB'S TOP TIP
Do not strike the alternator.

Alternator testing

The simplest check is to use a voltmeter for measuring battery voltage. With the engine off and the car's systems powered-down, expect to see 12.4 volts for a charged battery. On alternators with internal regulators, expect to see around 13.5-14.5 volts with the engine running. With the electrical ancillaries activated and the engine running above idle speed, this figure should not dip below 13 volts.

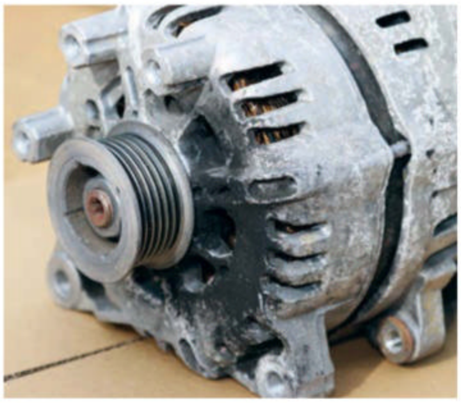


Testing smart alternators is more complex, because the output voltage is controlled by the engine ECU, allowing voltage to vary with driving conditions. Autoelectro advises that a battery voltage measurement should be around 12.4 volts at engine idle but this guide does not guarantee that the unit is working properly.



◀ This is because you have not checked that the communication signal is working. Autoelectricians do this, by using an oscilloscope to see if the command signal changes with voltage, when power-hungry accessories, such as headlamps and heated rear windscreens, are activated.

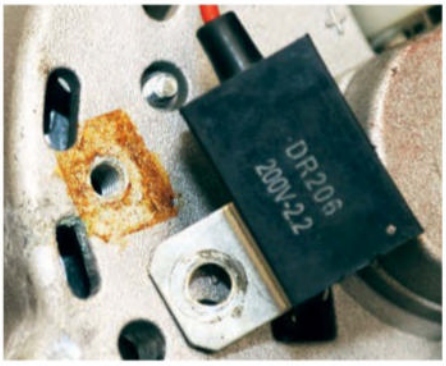
▶ As most car owners do not have access to such equipment, you can still check the communication between the ECU and alternator, by disconnecting the communication wire. This may cause either the battery charge lamp, or an engine Management Indicator Lamp, to illuminate. However, ensure that your diagnostic equipment is sufficiently advanced to extinguish them. Never disconnect the main power output wire(s) with the engine running.



◀ Aside from a voltmeter, the second most useful tool at your disposal is your eyes. Fine black dust, surrounding the front face, indicates auxiliary belt drive slip. Therefore, should output be down, it may be worth servicing the Front End Auxiliary Drive system first, before condemning the more expensive alternator.

▶ Consider where your alternator is situated. Oil leaks, which can emanate from a fluid reservoir, sited about the alternator, can contaminate the unit's internals, as well as dirtying the outer casing. Water ingress is a little harder to identify but corrosion (as pictured) is the main result.

Water ingress causes the internal stator to swell and generate forces that are sufficiently high to destroy not just the casing but also your surcharge deposit.



Check your car's wiring diagram to identify the earth points. Any corroded earth leads have the potential to affect the entire electrical system, not just the alternator. Some alternator components use the outer casing as an earth point, so ensure that the contact points are free from corrosion.

Corroded electrical connections create high electrical resistance, preventing the alternator from working properly. This can affect not just the main power feeds (such as that pictured) but also the smaller and more delicate communication pins.

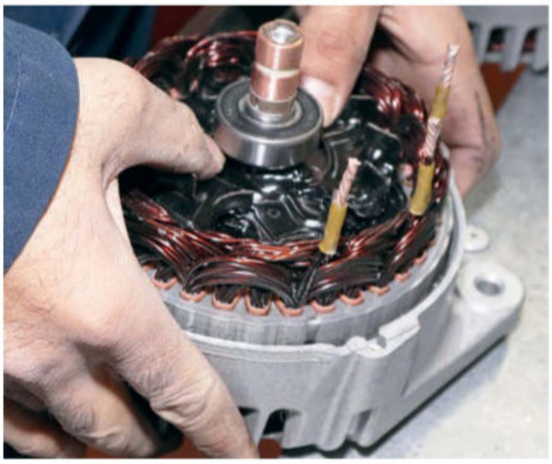
ROB'S TOP TIP

Check the belt drive, before condemning the alternator.

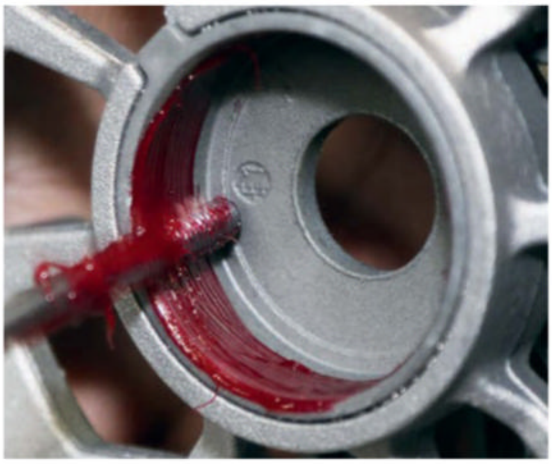
Alternator pulleys

▶ Classic car alternators and BSGs tend to employ solid pulleys. Some BSGs (such as the Valeo i-STARS units) have the pulley welded to the rotor. However, many cars on British roads, diesels especially, possess either Overrunning Alternator Pulleys (OAP), or Overrunning Alternator Decouplers (OAD). Both types disconnect drive from the FEAD belt to the alternator's rotor, under certain circumstances. The logic is to reduce not only fuel consumption and emissions but also to curtail shock loadings from being transferred suddenly to the FEAD drive, which extends belt life by as much as ten times.

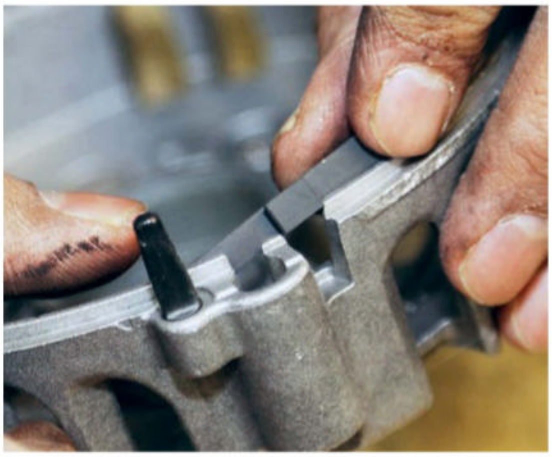
Yet, being moving parts, OAPs and OADs do not last forever. Should you notice the belt, or its tensioner, oscillating excessively, or noises from the FEAD drive, suspect that the alternator pulley has failed. Both types can be identified, by a plastic cap being installed to the pulley end. You should replace these pulleys whenever you renew the tensioner and belt, because they all form part of the FEAD drive. Some pulleys require special tools to install them, although tool kits are available to buy. Obviously, attempting to weld-up a seized pulley, or fit a solid replacement is an ill-advisable false economy.



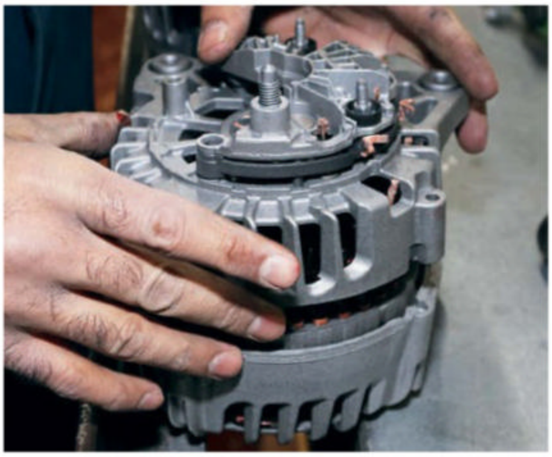
29 ◀ **Within Autoelectro's reassembly line, the remanufactured and new parts are united. Firstly, the remanufactured rotor is fitted within the remanufactured half casing, containing the stator.**



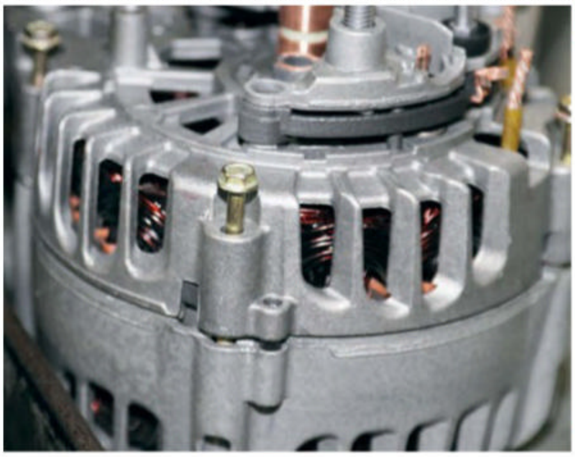
30 ▶ **Before the rear case is fitted, the rear bearing housing is lubricated, where necessary. Alternatively, any bearing plates are refitted with new bearings.**



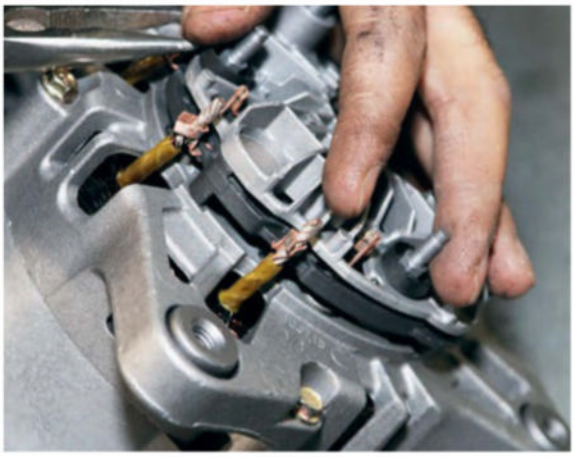
31 ◀ **Many alternators boast gaskets, or small rubber fittings. These parts were removed and cleaned thoroughly, before being reunited. Where such parts cannot be reused, new replacements are fitted. Sometimes, Autoelectro has parts remade specially.**



32 ▶ **As the two halves of this alternator are bolted back together, note how the stator wires protrude through the casing.**



33 ◀ **The through bolts, which have been cleaned and, where necessary, replaced, are tightened evenly to their prescribed torque.**

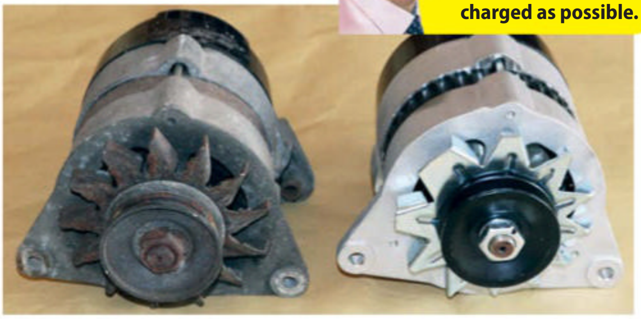


34 ▶ **The stator wires are then clamped to the rectifier unit...**

ROB'S TOP TIP

Keep your battery as close to fully charged as possible.

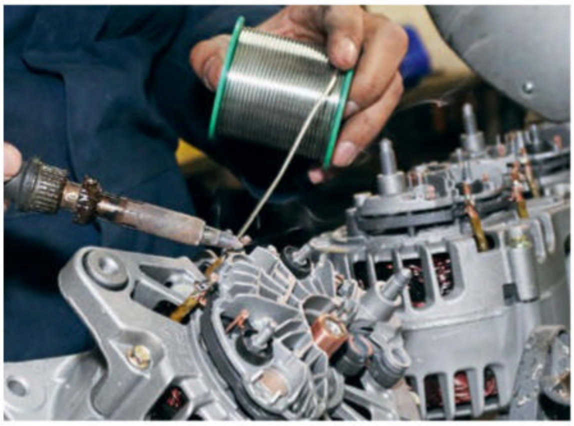
Copy alternators



▶ Car manufacturers do not produce alternators, or BSGs. Instead, they engage Original Equipment (OE) suppliers that supply rotating electrics, specified to the vehicle's needs. These companies include famous names, such as Bosch, Hitachi, Denso, Mitsubishi Electric and Valeo. Autoelectro remanufactures OE supplier units, only. Yet, what are the alternatives?

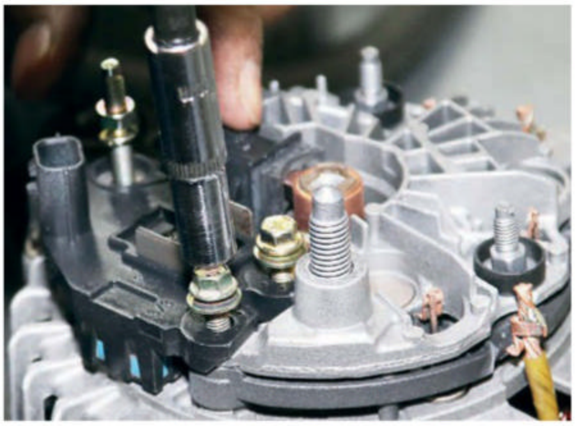
Copy alternators tend to originate from China, catering mainly for the most popular, high-demand and fast-moving parts. These units are entirely new, including the casing, rotor and stator. While some units can be fit-for-purpose, Autoelectro highlights their variable quality. Differences can include casings made from diverse materials, or possessing thinner constructions. Rotors and stators can possess less copper, meaning that they cannot generate sufficient current in high-load situations but produce more heat. The rectifier electronics can also lack sufficient margin to work at their rated maximum capacity for very long. We have also heard of high-capacity alternators not having their rotors magnetised, as per the OE part.

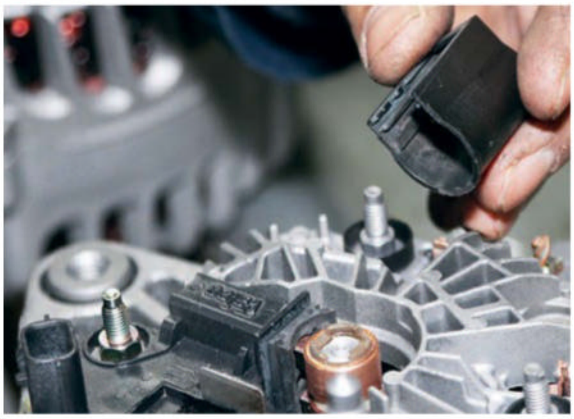
To see if Autoelectro's findings hold merit, *CM* performed a blunt test. As weight is a good indicator of metal content, we weighed a new copy Lucas ACR alternator and a worn old Lucas OE unit. Sure enough, the original was heavier, weighing 3895g, compared with the copy's 3809g. Due to these compromises, Autoelectro states that it cannot guarantee the quality of any copy parts, which is why any such units it receives are rejected as scrap.



35 ◀ **...before being soldered together.**

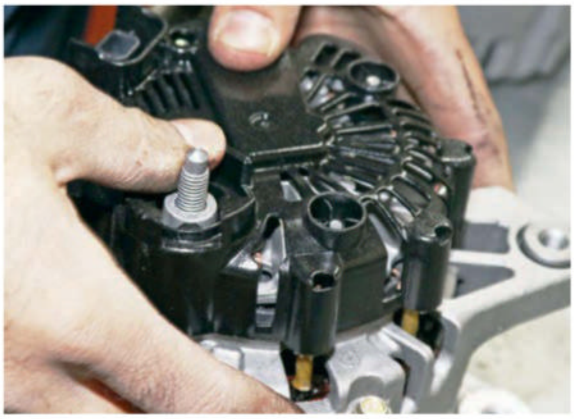
36 ▶ **Modern brushes tend not to be replaced individually. Instead, a new brush box (which may include the regulator) is fitted. Autoelectro ensures that genuine replacement parts are used, to ensure reliability and performance.**

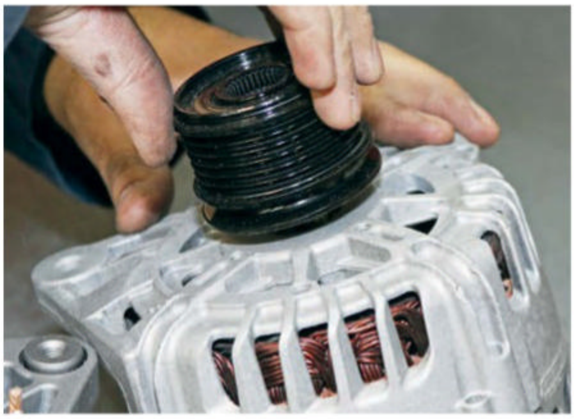




37 ◀ **This slip ring remains exposed and so, to protect it from contamination and damage, its plastic cap is fitted. Not doing so is a shortcut that will reduce the alternator's lifespan.**

38 ▶ **The rear cover moulding is located into position and secured.**





39 ◀ **Where fitted, the front fan is refitted, along with the pulley. As this alternator possesses an overrunning pulley, a new OE-quality replacement is used.**

40 ▶ **These pulleys have to be torqued with special tools, before the protective cap is installed.**

BEFORE START
1st TIGHTEN CHAIN 2nd TIGHTEN BELT
ONCE STOPPED
1st RELEASE BELT 2nd RELEASE CHAIN
ELT TENSION

41 ◀ Autoelectro tests every alternator and BSG that it remanufactures. The firm, therefore, boasts comprehensive test equipment that runs each alternator and BSG through a prescribed sequence.

AUTOELECTRO
Since 1986
STARTER MOTORS & ALTERNATORS

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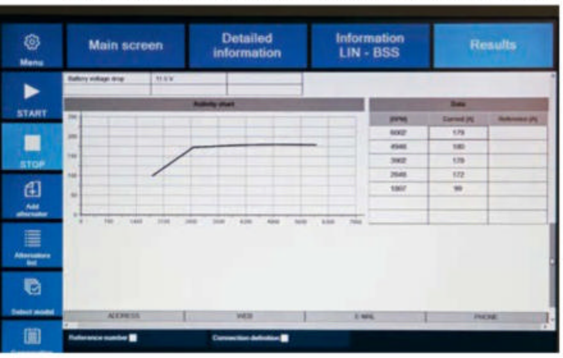
www.denso-am.eu/products/rotating-electrics/alternator

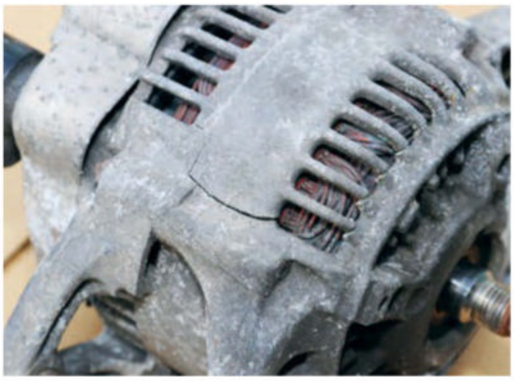


42 ◀ The assessor interprets the results. Every alternator's journey throughout the remanufacturing process is logged, so a fault in any component can be traced with utmost accuracy.

43 ▶ Once complete, each alternator is packaged securely, along with any technical notes, if required, ready for dispatch. Autoelectro highlights that every one of its remanufactured alternators is supplied with a comprehensive two-years guarantee.

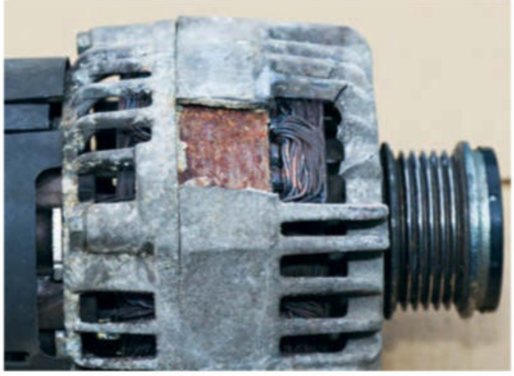
TOP 5 TIPS: Preserving your surcharge

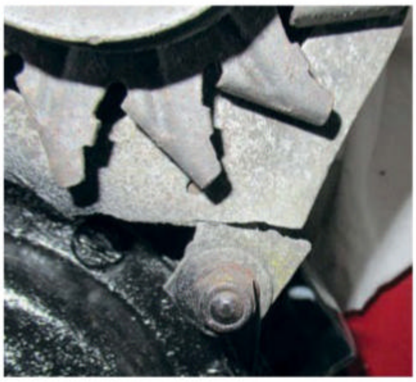
▶ While a faulty alternator might seem junk to you, it has value to a remanufacturer higher than scrap. This is why many remanufacturers add a 'surcharge' to the price, which is refunded, once they receive your old unit in good condition. The problem, says Autoelectro, is that many people damage their alternators, often unintentionally, by careless removal. Ultimately, this costs them their surcharge. Yet, most instances can be avoided, by heeding these five simple tips.



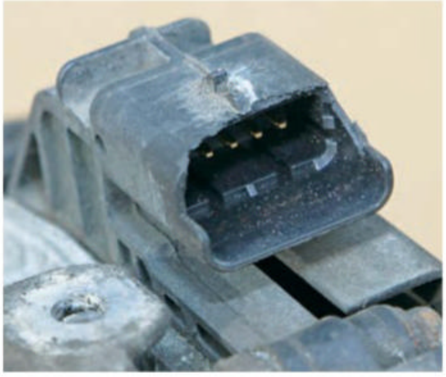
◀ Even hairline cracks in the casing reduce a remanufacturable alternator to scrap. While it looks as though this alternator has been struck, water has entered the unit, causing the stator to swell, cracking the casing.

▶ This alternator has been either dropped, or struck, causing a chunk of the casting to break away. This obvious damage means this unit should be consigned to the scrap bin.

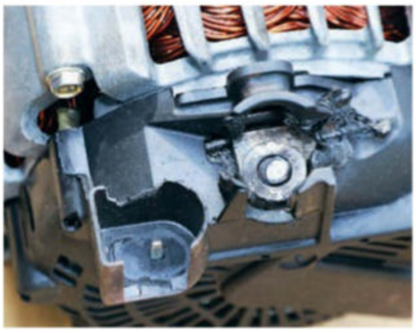




Incorrect fitting can damage the casing, too. Where alternators possess a pair of mounting brackets, ensure they are tightened evenly. Not doing so exerts excessive force which can fracture, or even break, the casting.



Using excessive force, or not packaging the alternator securely, can break the fragile plastic low-voltage plug connections. This might seem trivial but replacement mouldings tend to be unavailable, meaning that your surcharge might not be refunded.

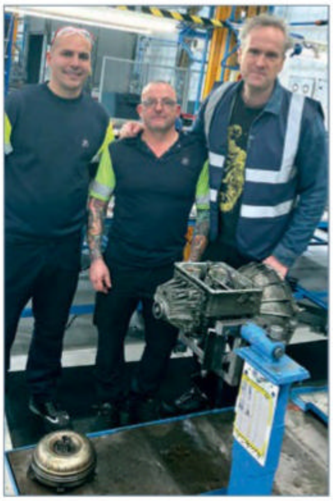


Ensure that all high-voltage cabling is fitted properly. The cabling on this alternator was not tightened to the terminal correctly, resulting in arcing and melting of the plastic moulding. Note also that the data connector is broken. Again, as replacement plastic parts are unavailable for this part, it has to be scrapped

CM Insider

Martyn Knowles brings you news and product reviews from the automotive industry

ZF Aftermarket and **Brake Engineering** to feature in upcoming episodes of ***Car SOS***



▶ ZF Aftermarket is set to take the spotlight in two upcoming episodes of *Car SOS*, as renowned TV presenter and engineering expert Tim Shaw visited both ZF Aftermarket's Centre of Competence in Nottingham and Brake Engineering's Centre of Excellence in Wrexham to showcase the company's expertise in remanufacturing and advanced vehicle technology.

The episodes will air on National Geographic on May 8th and May 15th and will be repeated on More4 and Channel 4.

Tim Shaw's visit to the Nottingham facility offered a unique insight into ZF Aftermarket's state-of-the-art remanufacturing processes and technological innovation. The Centre of Competence is at the forefront of automotive engineering, delivering solutions for a wide range of vehicle systems.

Meanwhile, the episode airing on May 15th will feature Brake Engineering's Centre of Excellence in Wrexham, where Tim Shaw explored the meticulous remanufacturing process behind the company's renowned brake calipers.

Brake Engineering has built a strong reputation for its 10-stage core remanufacturing process, ensuring that each caliper meets or exceeds OEM standards. The episode will highlight the importance of remanufacturing in reducing waste, minimising environmental impact and delivering reliable braking performance.

Tim Shaw's involvement with Brake Engineering extends beyond *Car SOS*. In late 2024, he collaborated with the brand to release a series of three videos focused on the art of remanufacturing calipers. The campaign centred around a set of Ford Scorpio Cosworth rear brake calipers, which Shaw brought to Brake Engineering's Wrexham facility for expert restoration.

Remanufacturing remains a key focus for Brake Engineering and ZF Aftermarket. By reusing core materials and reducing the need for new manufacturing, the process significantly cuts waste and carbon emissions – Brake Engineering alone saves 951 tons of CO_2 emissions every year.

New **QR code** service launched to make sharing driving licence information easier

▶ Motorists who have signed up for a Driver and Vehicles account can now use a QR code to share their driving licence information quicker and easier than ever before.

Once you have signed up for an account, you'll be able to generate a QR code and share your driving licence information safely and securely with third parties such as car hire and insurance companies.

This new service is only available to Driver and Vehicles account users and is the latest in a range of benefits available through the account. This includes the ability to choose to receive vehicle tax reminders by email or text.

To set up your driver and vehicle account visit here: **www.gov.uk/driver-vehicles-account**

IMI jobs portal expands

Automotive work experience placements for 2025

▶ Part of the Automotive Work Experience (AWE) Programme, the portal now enables pupils under the age of 16, educators, and businesses to connect, providing young people with valuable industry experience.

Launched by the *School of Thought Automotive* in partnership with *The Institute of the Motor Industry* (IMI) and *Autotech Academy*, the AWE Programme is tackling the skills crisis that has left the industry with an estimated shortfall of nearly 18,000 skilled professionals. Initially unveiled during the inaugural Automotive Work Experience Week (AWE) last year, the programme sparked significant conversation across the sector, garnering over 8000 visits to the *School of Thought Automotive's* website during its launch week alone.

Designed to challenge the misconceptions surrounding careers in the automotive industry, AWE aims to showcase the diversity of roles available, from technical and mechanical positions to management and marketing pathways. Work experience placements offered through the portal are set to provide young people with an authentic and practical taste of what the sector has to offer, aligning with Gatsby Benchmark 6, which underscores the importance of workplace experiences for pupils by the age of 16 and again by the age of 18.

For participating automotive businesses, the initiative offers an invaluable opportunity to engage with the next generation of skilled professionals. Placements can be tailored to suit each company's needs, ranging from a single day to a week or even a few hours per week, ensuring flexibility for both pupils and employers. With nearly 100 placements already pledged, the portal remains open for more businesses to register their support.

The work experience portal is now live, enabling pupils and schools to secure placements, while remaining open for businesses to continue pledging their support. Work experience through the AWE Programme not only fulfils the automotive sector's current and future needs but also empowers the next generation to explore a rewarding career path.

Pupils and schools interested in securing a placement can visit the portal at **https://jobs.theimi.org.uk/work-experience-placements**

News in Brief

LIQUI MOLY
DPF-/OPF-Reiniger
DPF/GPF Cleaner

Efficiently clean diesel & gasoline particulate filters

▶ The new DPF/GPF Cleaner from **LIQUI MOLY** allows particulate filters to be cleaned thoroughly without removal. Under unfavorable conditions or in the event of malfunctions, DPFs can clog up with soot. The new **DPF/GPF Cleaner** dissolves the hardened soot layer on the surface of the filter and enables active regeneration while driving or using a vehicle diagnostic device – without having to remove the filter. The additive specialist already offers a proven probe solution that efficiently lifts even stubborn residues with 1.5 litres of cleaning fluid and eight bar pressure. It is an economical solution for many applications that can be used without additional equipment.

31 vans stolen everyday

▶ A staggering 11,273 vans, worth an estimated £200 million, were reported stolen across the UK in 2024, averaging 31 thefts a day, according to new analysis by **Direct Line** van insurance. Just two in five (39%) stolen vans were recovered by the police – totalling 4450 vans. While van thefts have declined in 2024 compared to 2023, the high number of thefts highlights the ongoing issue of van security. Among stolen vans, the Ford Transit was the most targeted model, with 5906 stolen. Given the Ford Transit is the UK's most licensed van, its popularity makes it a prime target for criminals. Despite this, more than 2000 Ford Transits were successfully recovered by the police. Amongst the top five most stolen van models, the Peugeot Boxer had the highest proportion of vans stolen compared to the number of licensed vans on the road, with 7.7 thefts per 1000 licensed vans.

NEW FROM THE TOOL CONNECTION

Simplify auxiliary belt maintenance

£55.58 RRP
www.lasertools.co.uk/Product/9042

▶ Laser Tools has introduced a versatile set of four auxiliary belt tensioner tools designed for professional and home mechanics working on Citroën, Peugeot, Volkswagen Group and other vehicle makes (part number **9042**). Essential for safely and efficiently releasing tension on auxiliary drive belts during removal and fitting.

These adaptors securely latch onto the belt adjusters, providing a stable attachment point for applying force with a 17mm spanner or 3/8in-drive socket, to safely release belt tension.

The four tensioner tools in the set are compatible with Audi, Citroën, DS, Fiat, Ford, Mazda, MINI, Mitsubishi, Opel, Peugeot, Suzuki, SEAT, Skoda, Toyota, Vauxhall, Volvo and Volkswagen. Covers PSA engines (DV4, DV5, DV6, DW10, DW12 diesel: 1.4L, 1.5L, 1.6L, 2.0L, 2.2L) and VW Group engines (1.8L, 2.0L petrol and 1.9L, 2.0L diesel). Matches PSA OE numbers 01099, 01099-A, 01099-B1, 01099-B2, 01099-C, and 01099-D.

SEALEY launches latest Tool Promotion

THE 2025 TOOL PROMOTION
SEALEY
OVER 190 NEW PRODUCTS INSIDE!

▶ The latest Tool Promotion from Sealey features more than 190 new products and over 1600 deals, valid until the end of June. This season, explore their selection of spring-cleaning essentials, from car cleaning equipment and pressure washers to garden hoses and lawnmowers.

Mobile Workstation

▶ The AP201 adjustable-height mobile workstation with removable top tray is the ultimate solution for staying organised. Designed for versatility, this workstation features an adjustable height, ranging from 775mm to 1200mm, allowing users to customise it for any task. Its well-thought-out storage system includes two magnetic collection trays, dedicated tool storage sections, and slots for screwdrivers and sockets, ensuring that essential tools are always within reach. The removable top tray adds further functionality, doubling as a tool creeper for ground-level automotive work.

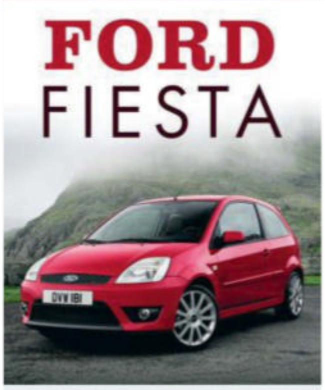
Win the SV10.8 Series Power Tool Bundle

WIN
£800
ULTIMATE SV10.8
ONE BATTERY
POWER TOOL
BUNDLE
ENTER NOW

▶ One lucky winner will receive a selection of 10.8V power tools designed to make everyday tasks quick and easy. The prize package includes ten tool bodies, two 4Ah batteries and a dual battery charger valued at over £800 list price. Enter online today for an opportunity to take home this premium tool bundle.

To explore all the new products and exciting discounts and enter their giveaway, visit **www.sealey.co.uk**.

News in Brief



Ford Fiesta by *Mark Bradbury*

▶ The Ford Fiesta has been one of the most successful superminis and one of Britain's most popular cars for decades. First launched in 1976, the Fiesta was a front-wheel-drive 'world car' that was Ford's answer to the successful Renault 5 and Fiat 127. As this book shows, the Fiesta went on from strength-to-strength, establishing itself as the ubiquitous second car, student's car and learner's car. In this readable book, motoring expert Mark Bradbury explores the design and development of the Fiesta as Ford sought to produce a small car for the modern city driver. The book covers the launch and reception by the public and motoring press and the production of the now classic Mk1, 2 and 3 models. The book also covers the sporty Fiestas, including the RS and turbo versions as well as derivatives and variants, including vans, the Ka and the Puma. Bringing us right up-to-date with the latest models, the book also reflects on the legacy of the Fiesta as it reaches the end of its production. Accompanied by a full range of illustrations, this is a concise guide to a much-loved car. Available from May 15th, paperback, 96 pages. Visit **www.amberley-books.com** for more info.

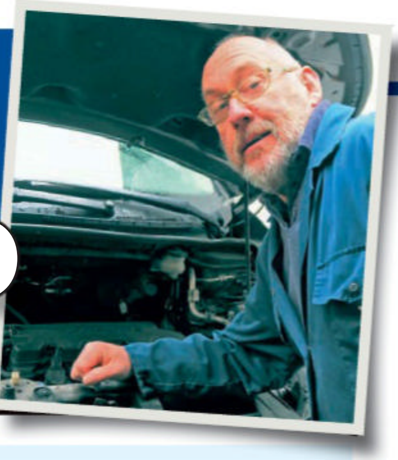
Clarke

COMPETITION WINNERS

AIR EQUIPMENT
M CARTER

Tales from the workshop

Fixing advice from our garage proprietor **Steve Rothwell**



MAZDA MX-5

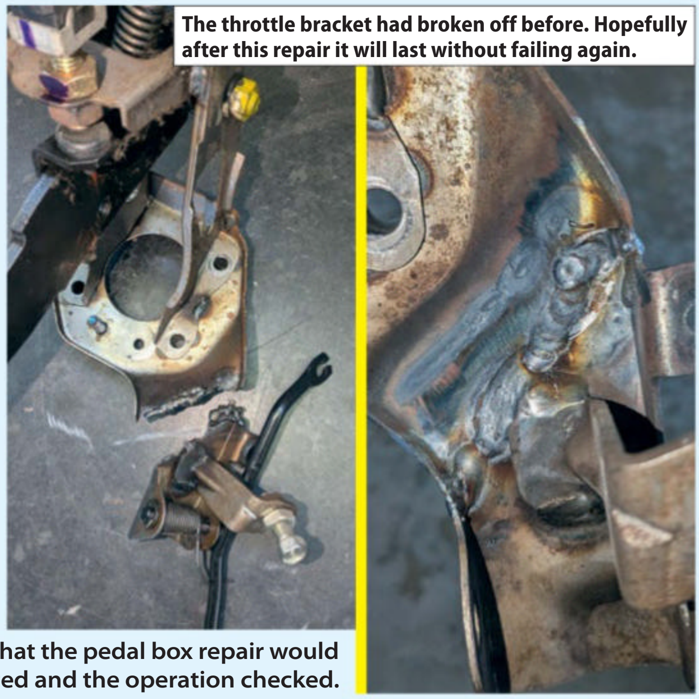
Lost throttle

Driving along quite happily, the owner of this 1990 MX-5 was quite shocked to feel the throttle pedal disappear beneath his foot. Unlike the majority of more modern vehicles on the road now which rely on an electrical connection from the throttle pedal, this Mazda uses a cable between the driver's foot and the throttle body.

This reason for this failure was that the throttle pedal pivot had broken away from the pedal box. This is not something that it all that common now, although I do see broken pedal boxes occasionally. They are normally cracked at the brake or clutch pedal. The effort from the throttle pedal is rarely enough to cause such failure.

Removing the old pedal box, I could see that this had been repaired previously and when I went to order a new pedal box I discovered why. This part is not now available and getting one would be like finding hens teeth. The plan was to make a repair which would hold out better than the previous attempt.

After a little bit of welding and manipulation I was happy that the pedal box repair would last and so once cooled and painted the pedal box was refitted and the operation checked.



The throttle bracket had broken off before. Hopefully after this repair it will last without failing again.

HONDA JAZZ

Thin belt gets noisy

This 2007 Honda Jazz 1.4 petrol had been screeching after starting up for the past couple of weeks, but the owner had made use of the radio volume control to drown out the noise.

With the problem getting worse and the screeching sound continuing long after the engine had been started in the morning, it was finally decided to bring the Honda along to me with the view of getting the problem sorted.

When I heard the symptoms, I suspected that the fault was going to be due to a slack or failing alternator drive belt, but I did not expect the problem to be quite as severe as it was.

One look down at the state of the auxiliary drive/alternator belt, was all that was needed to determine the reason for the ongoing noise problem. The belt did not only look to be quite old and past its time for replacement, but it was about half the width it should have been. Looking at the amount of area that was left to provide grip it is no wonder that the poor belt squealed under load.

A new belt fitted and correctly tensioned up rectified the noise.

The auxiliary drive belt had broken up and was now less than half of its former self.

VAUXHALL VIVARO

Knocking suspension

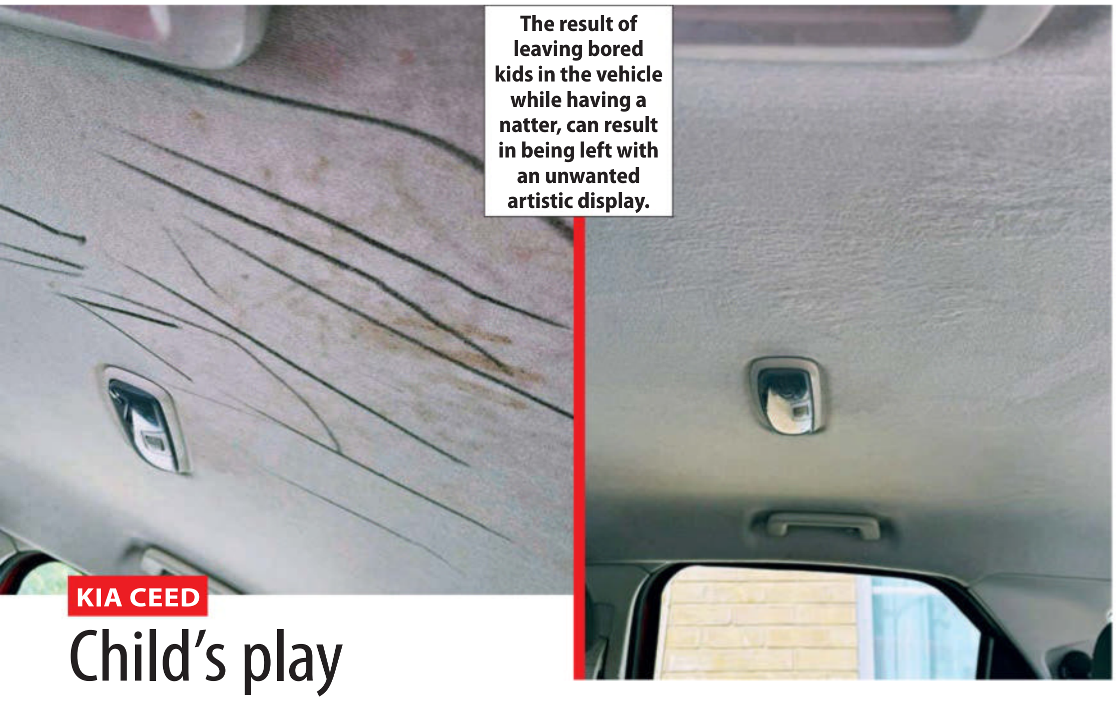
The rhythmic thudding coming from the front of this 2013 Vauxhall Vivaro A 2.0 diesel, was giving the owner a headache. He had heard the noise start slowly a couple of days ago and now the knocking was constant and appeared to be within the cab of the van.

He knew that if he didn't get this fixed soon it would be unbearable to drive, and so booked the van in with me to look at.

The noise was not difficult to find, and it was indeed coming from within the vehicle. On this Vivaro the strut top mounts sit inside the vehicle under the dash area. The knocking/thudding was the result of the strut top mounts having failed and allowing the top of the strut to knock up and down in place.

Once the access to the top of the strut is cleared, the job is not a difficult one – the book time on replacing the top mount is 0.9 hours. This was achievable and the owner was relieved when picking up the van that the noise had now gone.

The top strut mount which sits inside the vehicle needed replacing to silence the unwanted thudding the driver was hearing.



The result of leaving bored kids in the vehicle while having a natter, can result in being left with an unwanted artistic display.

KIA CEED

Child's play

▶ Some jobs are described as child's play indicating that the job is easy to carry out. The term child's play on this 2012 Kia Ceed is more a description of the problem than the remedy. The owner had been shopping with his young children, and when returning to the vehicle had sat them inside and was just about to strap them in position in their child seats, when a mate he had not seen for a while walked past.

A long conversation ensued with no thought of the youngsters, who were being nice and quiet presumably sitting in the Kia.

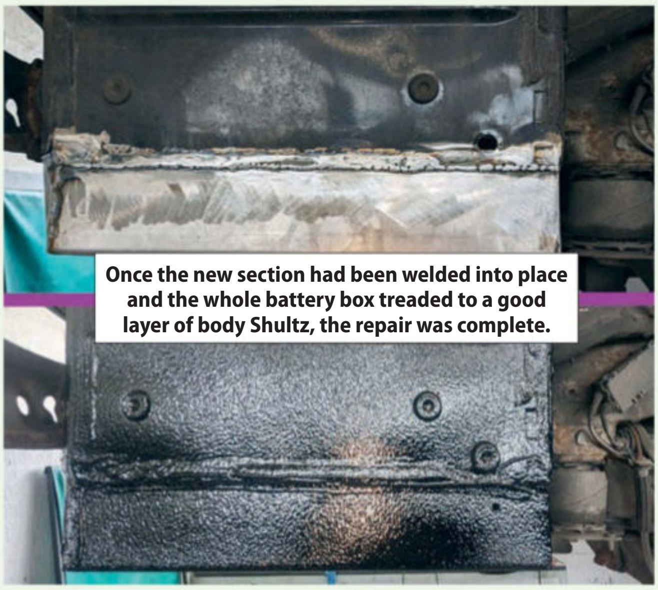
Only as they said their goodbyes did the owner put his head back into the motor to strap the kids in place before starting off. It was at that point he realised that the reason they had been so quite is because they were happily occupied with their crayons decorating the roof of the Kia.

The owner was hoping that I would wave my magic wand before his wife saw the mess and gave him a roasting about not keeping an eye on the kids while they were in the Kia.

This one I passed to my local valeting firm, who did a much better job than I would have done.

BMW 5-SERIES

Battery box repair



Once the new section had been welded into place and the whole battery box treaded to a good layer of body Shultz, the repair was complete.

▶ This 2004 BMW 530i was in general in a good condition and the body looked to be in perfect condition – the paintwork was shining, and the owner had definitely washed and polished the 5-Series before its MOT.

Unfortunately, the underside of the vehicle did not reflect the shiny upper side, and the MOT revealed an extremely corroded battery tray that was in danger of allowing the heavy 12V battery to escape through the bottom to freedom.

The good news was the rot was restricted to the base of the battery carrier and so it was not too difficult to fabricate a new base to the battery carrier, which once the old corrosion had been ground off, could then be welded into place.

With the new section welded in and then the whole area rustproofed with a good coating of Shultz on the outside, the vehicle battery could be refitted, and the BMW was ready to go back for the re-test, which it thankfully now passed.

PEUGEOT

A classic

▶ This is not so much a tale from the workshop as a tale from my kitchen. One of my passions is to enjoy ground pepper on my meals. I do not like the white stuff or the ready ground black pepper but do enjoy using a grinder to freshly grind the peppercorns over my dinner.

Over the years we have had several pepper grinders in the house and the latest was the disposable type that comes with pepper corns. In the interest of preventing waste, we do normally refill these pots until the grinder is no longer efficient.

Deciding to get a pepper grinder that would look more acceptable on the table we then got a wooden set, which much to my disappointment was not a good grinder of the peppercorns. I then decided to do a little research to discover if there were any recommendations for a pepper grinder that would last and be efficient at the job.

This was when I discovered that Peugeot had been making pepper grinders for nearly 200 hundred years, long before they had begun on the production of motor vehicles (and bicycles).

I purchased the Peugeot grinder and discovered that this is a wonderful piece of equipment, and I would highly recommend Peugeot when you next consider a pepper grinder.

1812
1840
1874
1885
1891
1953
1983
1997
2018
2021

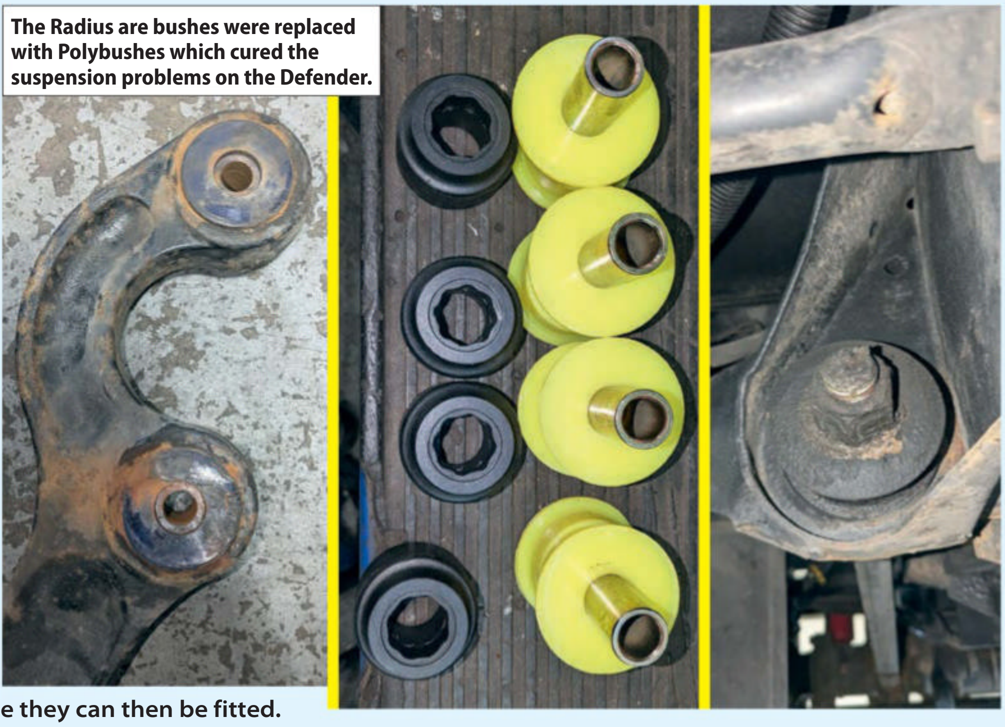
Long before the motor car was invented Peugeot were making top quality pepper grinders – and they still do.

LAND ROVER DEFENDER

Shaky suspension

▶ Described by the owner as a shake when pulling away and braking, this was more of a clunk, but it was a problem that is quite common on the Defender – and this 2015 2.2 TDCi was suffering from wear in the front radius arm bushes.

This is a common occurrence, and the quickest and easiest option is to fit a Polybush kit to replace the original bushes. Removing the original bushes is the worst part of the job and once the radius arms are removed and the old bushes out, then the arms can be cleaned up and with the new Polybushes in place they can then be fitted.



The Radius are bushes were replaced with Polybushes which cured the suspension problems on the Defender.

The book time on the job of removing and refitting both radius arms is 1.1 hours, but of course, these job times never take account of the corrosion that may have occurred under a Land Rover.

This one was not too bad and thankfully everything came undone as it was designed to do and with the radius arms cleaned and the new bushes fitted, the Defender was ready to go back out clunk free.

VOLKSWAGEN GOLF

Cooling system troubles

▶ Normally when a customer comes in with a cooling system complaint it is because the system is getting too hot, and they have concerns about the rise in temperature seen on the gauge.

The problem with this 2008 VW Golf TDI was that the temperature was not getting up to the normal position on the gauge. Cold running faults are normally caused by one thing, and that is a thermostat that is either stuck open or opening too early. That was the first check on this Golf and sure enough when the thermostat was removed it was found to be partially open.

The remedy was a new thermostat, but as the cooling system looked to be quite corroded it was also decided that while the system was drained down, flushing it through before filling with fresh coolant was a sensible idea.

With this done the new thermostat was fitted and the cooling system filled with a fresh mixture of anti-freeze.

When bled out and run up, the temperature gauge now sat nicely on the 90°C section.

The thermostat was renewed, and the cooling system and dirty expansion tank were flushed through before filling with fresh coolant.

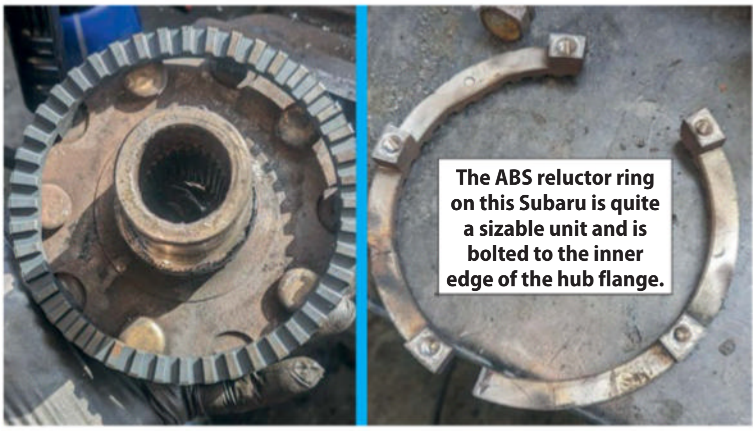
SUBARU IMPREZA

ABS ring

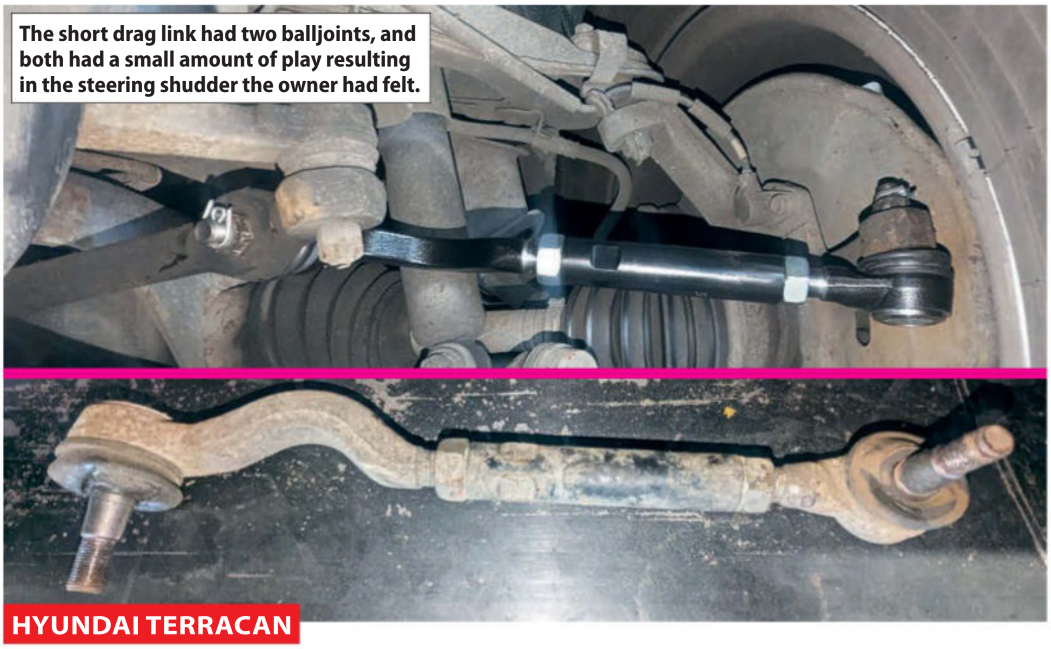
▶ ABS light on this 2007 Subaru Impreza 2.0 Turbo acted as it should when turning the ignition on, and after coming up briefly then disappeared, it was not until driving off that the light then came back on and stayed on for the remainer of the journey.

Reading off the fault code C0036: Wheel speed sensor ring, LH rear was showing as the fault, and so the area that needed to be checked was going to be the nearside rear hub. On this Subaru, the ABS reluctor ring is slightly different to most and instead of using a smaller ring around the circumference of the hub bearing, it uses a much larger ring bolted to the back of the hub flange. Upon inspection this ring had actually cracked, and a piece had dropped out – this would be the reason for the ABS light coming on and resulting code.

Ordering up the new reluctor ring, the old one was unbolted and the flange removed ready for the new part when it arrived. Once the new ring was fitted and everything was back together the ABS light was extinguished and all was well.



The ABS reluctor ring on this Subaru is quite a sizable unit and is bolted to the inner edge of the hub flange.



The short drag link had two balljoints, and both had a small amount of play resulting in the steering shudder the owner had felt.

HYUNDAI TERRACAN

Steering box drag link failure

▶ Most motors on the road now use the rack and pinion type steering system, but there are a few such as this 2007 Hyundai Terracan 2.9, that still use a steering box with a set of connecting drag links to transmit the steering control to the front hubs. This type of set up is more prone to several problems and will have not only more joints in the system but also an idler which can in itself become worn giving excess movement.

The shaking steering on this Hyundai may have been from a number of areas, but when it was in and up on the ramp, it was soon spotted that the source of the movement was all in the nearside front outer track rod balljoints, and so only the one short arm needed to be replaced.

The joints were quite accessible and so easily removed. The next task was to check and adjust the tracking and thankfully this was easily completed and the job finished.

FORD FOCUS

Gear cables

▶ Suddenly faced with a floppy gear lever, the owner of this 2015 Ford Focus TDCi had been cursing that they hadn't acted sooner. For the past couple of weeks the gear change had felt a little tight, but now the gear lever was flopping around, and no gears could be selected.

The Focus duly arrived at the workshop on the back of the recovery truck, and it was confirmed that the gear lever had separated from the joint connecting it to one of the two cables had popped off.

Having popped off once, it was certainly not worth attempting to reconnect the cable and so a new pair of gear selection cables was needed. The gearbox end of the cables needs to be accessed after removing the air cleaner and the front transmission cover. But that is the easy end.

The job of disconnecting the cable at the gear lever is not problematic, but the job of removing the old cables and feeding the new ones into place is a little less simple. Getting the cables fitted involves the centre console being removed and the grommet under the heater box is difficult to access. This is normally a job that leaves a couple of scratches on my hands.

Once done, though, the gear selection was smooth, and the owner was pleased with the result.

The cables come as a pair and need to be fitted as a pair. The job of feeding through the bulkhead under the centre console is a tricky manoeuvre.

JAGUAR XF

Pollen filter replacement

▶ Most of my customers book in for a service and then let me decide what needs doing depending on the mileage and the previous history of the vehicle. After servicing the same car for several years it becomes easy to know what will need doing.

When I see a new customer, or an old customer brings in a new vehicle, then I do normally try and direct them towards a full service to ensure we cover any underlying problems.

The owner of this 2014 Jaguar XF had been a regular for years and having recently purchased this Jaguar, which was in a good condition, asked me to do the usual and give it a good going over.

He did add one extra that I may otherwise not have carried out – he asked that after changing the pollen filter I give the heating and ventilation system a clean with one of those 'bomb' things.

He was referring to the aerosol unit that I had used on one of his past vehicles. It cleans the system leaving a fresh scent in the cabin. Happy to oblige, after the service was completed including the pollen filter, a can of Turtle Wax Odor X Whole Car Blast was used to ensure the vehicle was clean and fresh.

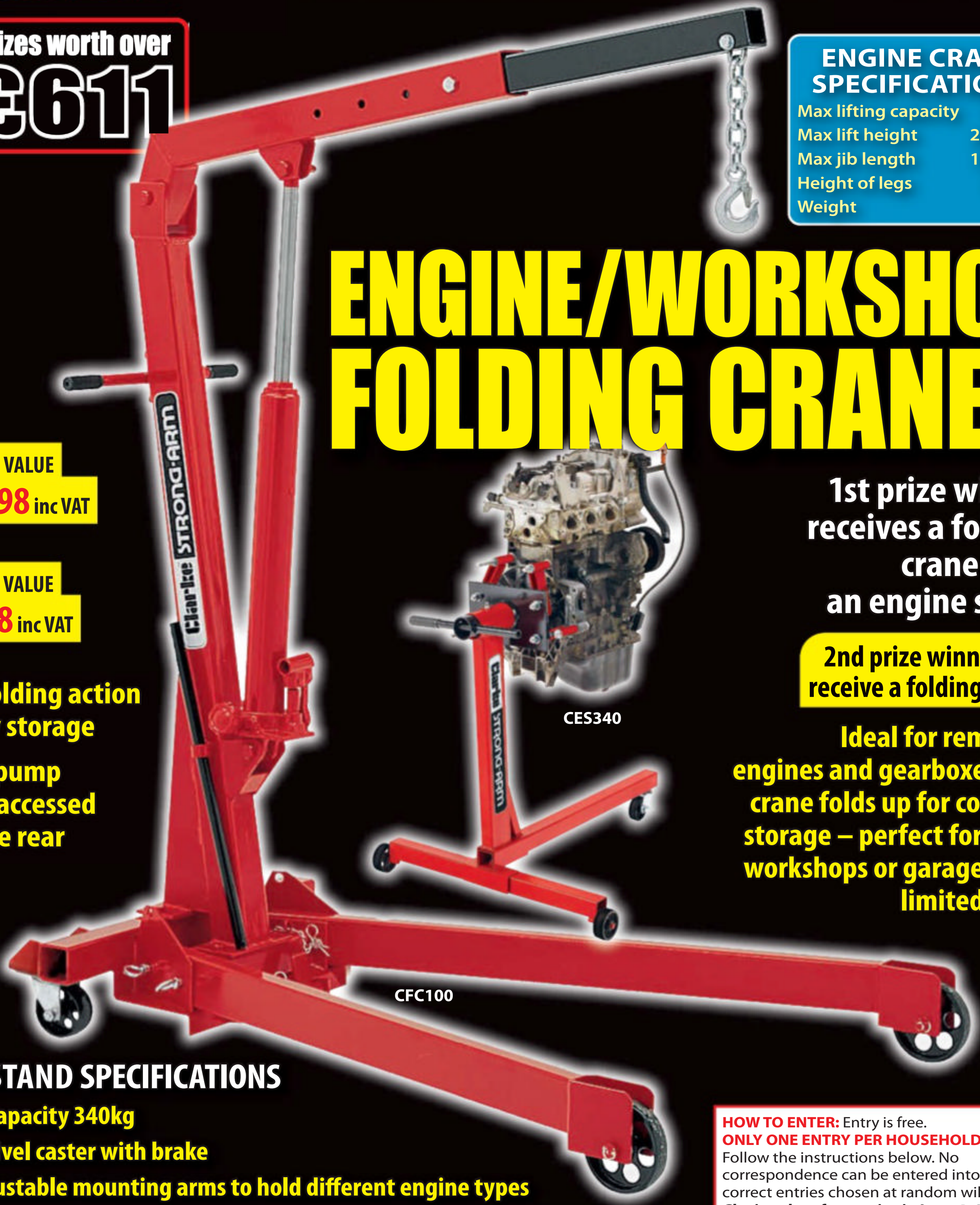
Once the pollen filter was in place, the system was treated to a cleaning of the heating and ventilation system using the Turtle Wax aerosol.

WIN WIN WIN WIN WIN WIN

Win Clarke

CAR MECHANICS
COMPETITION

2 prizes worth over **£611**



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Project Mazda MX-5 Mk3

Engine service

Part TWO: Martyn Knowles conducts an engine service and renews the rear brakes.

Our project MX-5 NC has limited invoices for servicing within the official Mazda handbook. There's a replacement Service Record booklet with service stamps – the last in 2019 at 69,510. Hand-written alongside the garage stamp is the words 'front discs/pads, oil filter'.

Our MX-5's last owner had owned this 2-seater Roadster Coupe since 2019, so the above was probably done prior to their ownership. The only service invoice sheet outside the Service Record is an estimate invoice – totalling £1555 in September 2022. The major parts were front brake calipers and caliper carriers. Plus, engine servicing items and front pads but no mention of front discs.

The actual invoice when the work had been completed (Nov 2022) was nearly £600. Either a deal was done, or the original parts quoted were Mazda OE, and aftermarket calipers/carriers were sourced. The front calipers and carriers have been changed as they both look newish. Unusual to see carriers changed, but I guess the slider pins were seized, and it was easier for the garage to quote to replace the lot rather than trying to take out the sliders and clean them up. Or the pins may have been rusty beyond a clean up and only available with a new carrier.

Front pads are listed but as I say not discs, so I can only guess that those fitted in 2019 were OK. A key fob battery and a full service made up the rest of the work involved. The mileage on the invoice is shown at 94,435.

So, we are now 2.5 years and approximately 8000 miles since that invoice and it's time to look over our 2.0-litre engine. Also, the rear brake pads looked a little thin from a glance through the alloy wheels, so I ordered a set of Blue Print discs and pads in advance.

We didn't check the diff or gearbox oils – we will do that when we fit a new clutch kit in a future episode.

AV14
YD60 ROU

Arriving at Vasstechnik to start the jobs seen in this episode, I noticed a 2014 MX-5 parked outside. Same colour, same hardtop roof. This later car being one of the last NCs as the ND was launched in 2015. Shown fitted with the optional fuel filler flap in polished aluminum, this MX-5 has the 1.8 4-cylinder with a 5-speed manual gearbox and has covered 62,000 miles. MOT failure repairs had just been completed – involving a new rear shock absorber and front brake service.

SERVICING

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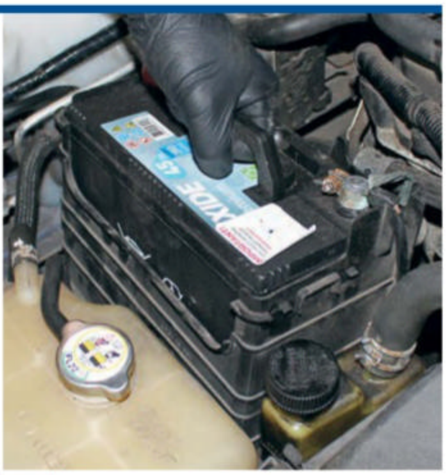
1 **I start by mentioning these anti-bacterial wipes I bought online. I thought the steering wheel was worn, but on closer inspection grime had built up. I needed something to wipe the disgusting crud away and found these wipes did the job well. They also stay wet in the container for months.**



2 **With the bonnet open we first noticed the 12V battery wasn't strapped down correctly. We could move the whole battery and its housing back and forth with our hand. We found the battery is slightly too wide. Consequently it doesn't fit in the plastic housing well and therefore the clamping mechanism doesn't work. An Exide EA456 B24 is fitted with a depth of 136mm. A 053 battery would be better as that's 129mm deep. Just a 45Ah battery is fitted to the MX-5. First battery you are offered if buying online is an Exide EA456, so more checks are required when buying a new battery. We will probably go for a Halfords HCB053 which has the 129mm depth. It will need to be fitted before the MOT in June.**

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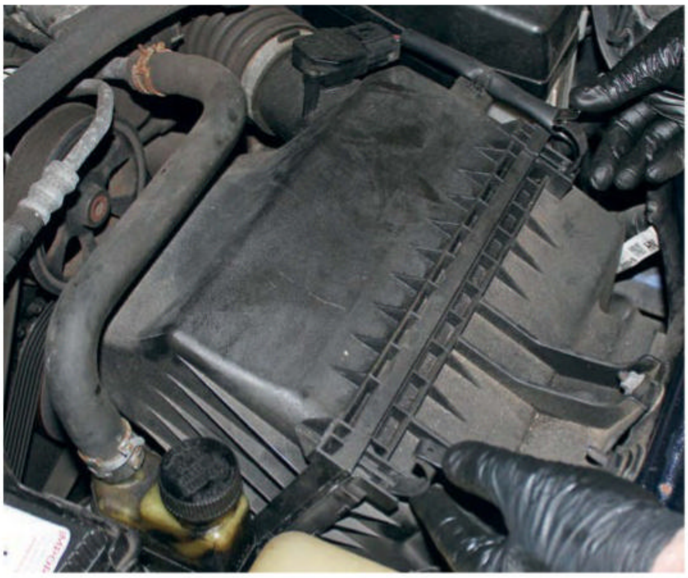
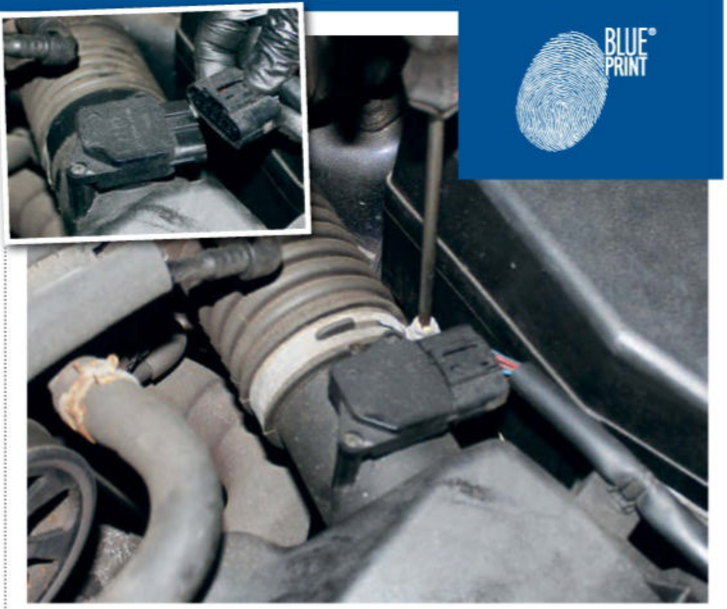
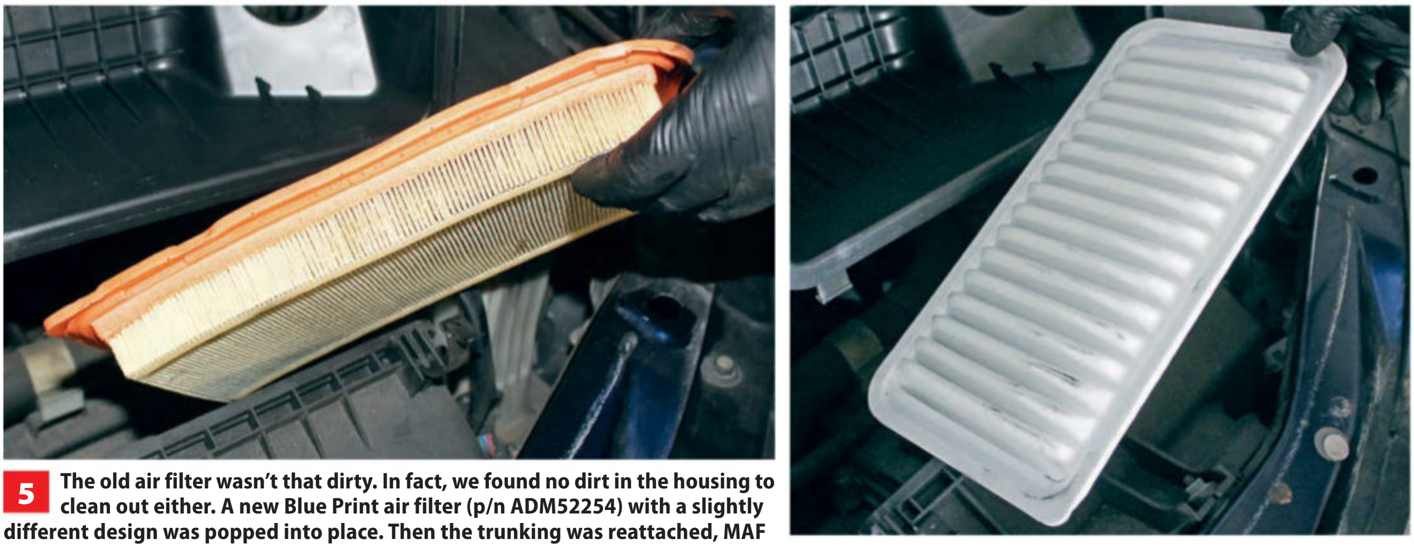


3 The air filter sits in this huge housing at the front of the engine. Two clips are released at the front easily enough and you could possibly lift the housing up and draw the old air filter out, but we wanted to look inside the housing to see if there was any dirt to extract.

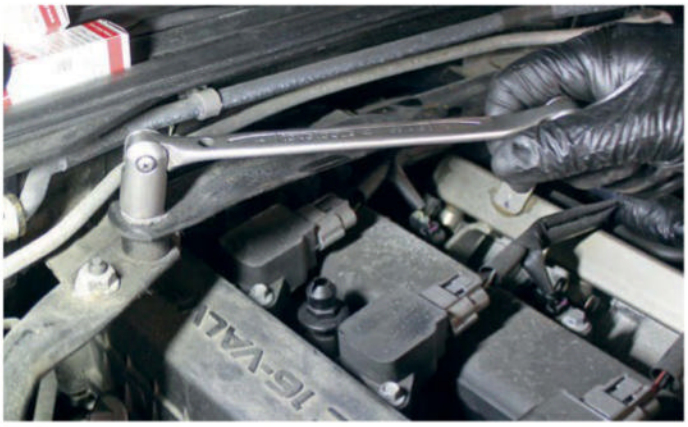


4 To get the air filter housing off, it's best to undo the trunking clip with a screwdriver until it is loose. And then release the MAF sensor wiring so that the trunking can be pulled from the air filter housing and the housing lid can be lifted up to gain more access.



5 The old air filter wasn't that dirty. In fact, we found no dirt in the housing to clean out either. A new Blue Print air filter (p/n ADM52254) with a slightly different design was popped into place. Then the trunking was reattached, MAF sensor connector slotted back on, and the housing clips closed it back up. Incidentally, we have been told the MX-5 does not have a pollen filter.

6 Next, we were changing the four spark plugs. They are found under this cover on top of the engine. It just lifts off with a tug.



7 This metal strut brace that runs across the engine hinders the removal of the last coil pack, so it's best to undo the two 14mm bolts and take the brace off for the time being.

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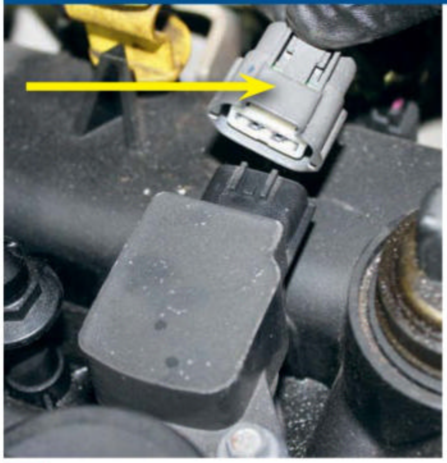
SERVICING CONTINUED



8 Each spark plug has its own coil pack above, so first we need to remove the electrical connector from each coil pack by pushing down on the locking tab (arrowed).

9 Pull all four connectors from the coil packs – you won't get them mixed up as they are each a given length – then undo each 10mm coil pack retaining bolt.

10 Pull up by hand each ignition coil and lay to the side. Our coils are in great condition, but if your engine needs replacements, Blue Print's (p/n ADM51490) are sold for around £55 at partsinmotion.co.uk

11 Use a 14mm shallow spark plug socket to remove each plug. The old plugs look in great condition and we have saved them in case they are helpful for another day.

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SUPER

12 febi can supply plugs for the MX-5 (p/n 13460). They have the traditional core compared to the old NGK plug shown in *Step 11*. Electrode gap is 1.1mm, with a thread of M14 x 1.25. Each plug is torqued down to 12±2Nm, although our experienced tech, Lee, did them up by hand.

13 ◄ Now onto the oil and filter change. We fired up the engine after swapping plugs and air filter just to make sure all was well. And it gave the engine oil a bit of warmth in the process to allow the oil to drain more easily. With the engine switched off and the MX-5 raised on a 2-post ramp or on axle stands, you will find two service hatches – one for the sump plug and one for the oil filter.

14 ► The crosshead screw holding the sump plug hatch was rusty and didn't want to budge. So... there's another way in by undoing the five 10mm bolts holding this shield in place. Removing this will also give us a much better view of the underside of the engine. With the shield off, we could see (and reach) both the sump plug and oil filter much better. And there were no oil leaks to be seen anywhere.

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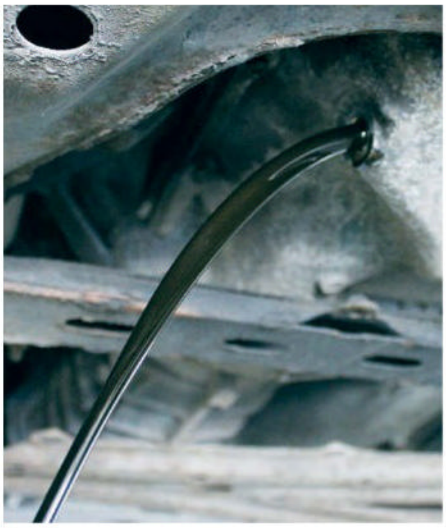
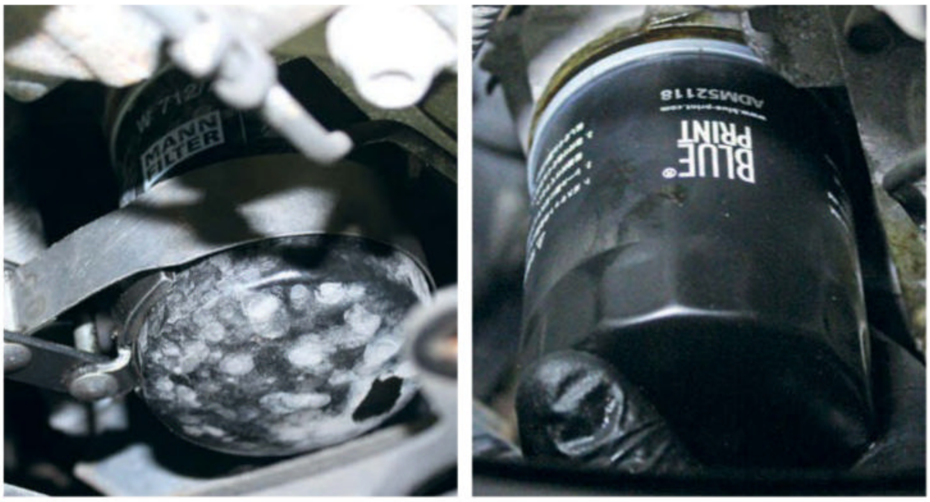


15 It was good to see the old engine oil removed from the sump after 2.5 years in there. Once drained the sump plug is tightened to 35Nm on the torque wrench using a new copper sealing washer on the old plug.

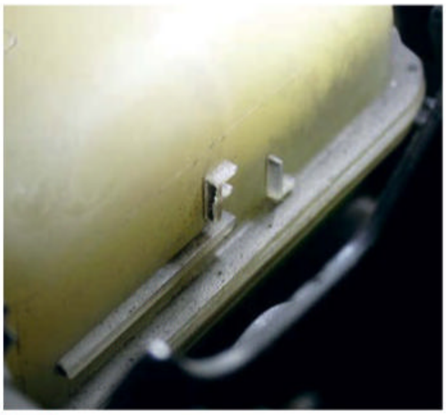


16 The oil filter is located at the back of the engine, a long way back from the front bumper as the engine is longitudinally mounted within the engine bay. A traditional oil filter removal strap was used to undo the old filter and a new Blue Print (p/n ADM52118) fitted. The fitted instructions on the new filter says: apply a thin film of clean engine oil to the seal; screw on the filter until the seal contacts and then tighten further by 3/4 to one turn. Fill the engine with correct quantity of oil; run at idle for 2-3 minutes, check for leaks and adjust oil level.

longlifeHC-FO
5W-30
High Performance Engine Oil
MADE IN GERMANY

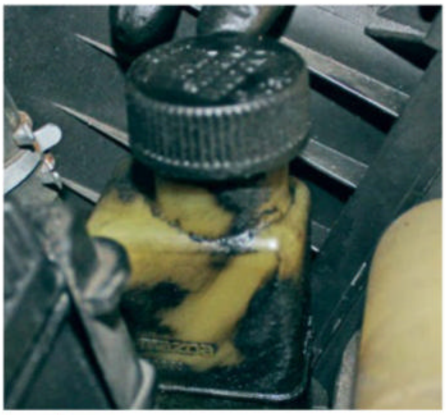
17 ◀ The MX-5 2.0 engine needs a 5W-30 oil to ACEA A1/B1 or ACEA A5/B5 specification with a Ford WSS-M2C913-D manufacturer recommendation. This longlife HC-FO febi oil is a recommended brew with a part number of 101152.

18 ▶ With an oil filter change, 4.5 litres of fresh oil is required to replenish the sump. However, it's best to fill with 4 litres first, then run the engine, checking for leaks around the sump plug and oil filter. Then turn off the engine and slowly add some more oil while checking the dipstick level, so that you get it spot on to the maximum level mark. As you can see there are two markers on the dipstick for 'min' and 'max'.



19 Other checks include looking at the coolant reservoir to view the level. As you can see here, on the side of the reservoir is a 'F' for full and 'L' for low markers. Our coolant is bang-on the 'F' spot. With a cold engine, we took off the reservoir cap and tested the coolant's freeze protection, which was down to minus 20°C – so we think the coolant is OK.

20 Shine a light through the brake fluid reservoir and look at the colour of the fluid. Our fluid looked in great condition, although as we were working on the brakes this time, we bled the system with fresh fluid, as the last fluid change was probably in 2022.



21 The Power Assisted Steering reservoir had a film of dirt over it. We cleaned off as much as possible to see the 'min' and 'max' markers on the outside. We also removed the cap to peer inside to see the condition of the fluid. All looked OK. The screenwash was topped up and the washers operated to make sure the wiper blades swept the screen satisfactorily.

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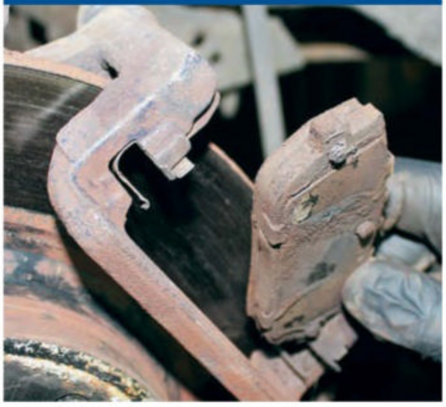
The MX5 Restorer (East Sussex) www.themx5restorer.co.uk
Vasstechnik vasstechnik.co.uk

REAR BRAKES

1 To start, we used our battery-operated impact gun to undo the four wheel nuts. A locking wheel nut key is used on the fifth wheel stud – the key fortunately found within the MX-5's cabin. We've ordered new febi wheel nuts and will fit them at a later date.

2 On the MX-5, the rear brake renewal procedure is pretty standard like most cars. First the caliper is removed by undoing the two 12mm caliper locating bolts, which also hold the slider pins in place. Our caliper is painted blue (colour-coded) – we're unsure if all MX-5 NCs are painted this way.



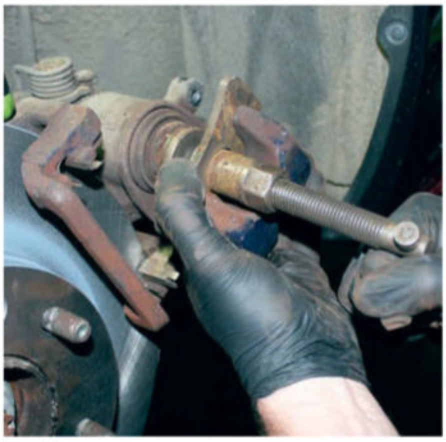
3 With the caliper held up above the carrier safely, we can remove the pads that are still within the caliper carrier. The inner pad is worn more than the outer and there's very little friction material left.

4 The caliper carrier needs to come off to remove the brake disc, so two 15mm bolts are undone. The carrier bolts were torqued to 60Nm on reassembly.

5 The slider pins on the caliper are checked to make sure they aren't seized. If you can pull them to and fro with your fingers with ease they should be fine. You can pull the pins out of the caliper completely if you wish, clean them up with a rotary brush wheel or emery cloth, before using a smear of brake grease on reassembly.

6 Finally, the brake disc can be pulled free from the hub (or tapped with a soft hammer if stuck). We used Blue Print discs (p/n ADM54360) and pads (p/n ADM54291).

7 Before the new disc goes on, we cleaned up the hub area with a wire brush. Plus the same procedure with the caliper carrier, cleaning the area where the pads sit.



8 Refit the carrier, then use an appropriate wind-back tool on the caliper piston, to retract it so the new (thicker) pads will slot in. Push the piston back to it is fully retracted.

9 Place the new pads into position, with a little brake grease smeared onto the pad's ears (where they sit on the carrier). Tighten the caliper to 20-25Nm. Pump the brake pedal a few times to locate the pads and all that is needed to do now is tighten up the wheel nuts to 103±10Nm

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DH30L‡	30L/day	010410685	£189.98	£227.98
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PLS220	230/3335	9	050410347	£639.00	£802.80	£766.80
PLS265B	225/3263	13	050411367	£698.00	£898.80	£837.60
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CTJ3GLS	3	020113085	£349.00	£418.80
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IBC20	12/24V	20A	010317012	£62.99	£75.59
IBC25	12/24V	25A	010317013	£79.98	£95.98
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CHT859	300	040213859	£197.00	£236.40
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CWM20	22.5Ltrs	Floor	050810020	£169.00	£209.99
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- 603x370x150mm

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LOAD RATING: 500KG PER DOLLY

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- Compact enough to fit in a vehicle glove box

JSM1000

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DONCASTER, DN2 4NY	01302 245999
DUNDEE, DD1 3ET	01382 225140
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EXETER, EX2 8QG	01392 256744
GATESHEAD, NE8 4XA	0191 493 2520
GLASGOW, G4 9EJ	0141 332 9231
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LONDON LEYTON, E10 7EB	0208 558 8284
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MC OPENSHAW, M11 1AA	0161 223 8376
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NORWICH, NR2 4LZ	01603 766402
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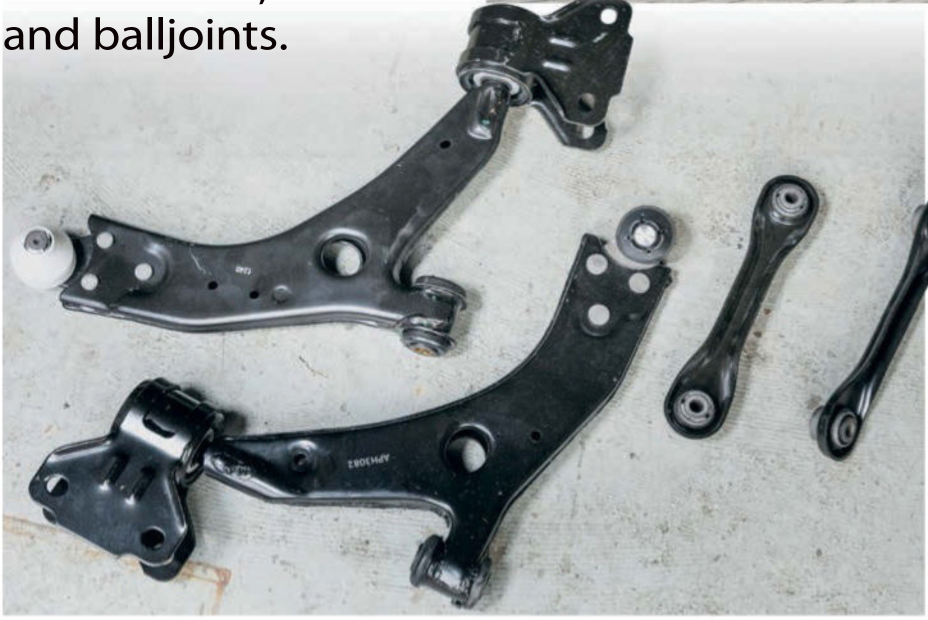
Project Ford Focus 1.0 EcoBoost

Focus Mk3

Part FOUR:

James Burr works on control arms, bushes and balljoints.



HELPFUL TOOLS

- T55 Torx socket
- Torque wrench
- Long pry bar

TORQUE SETTINGS

Balljoint pinch bolt	83Nm
Front bushing bolt	150Nm, then a further 90°
Rear bracket bolts to subframe	115Nm, then a further 90°

Bottom arms, wishbones, front control arms, whatever you call them, as they wear out (and they will wear out) they can throw up all sorts of problems on any car.

As we know, optimum chassis geometry and wheel alignment is important for handling, vehicle stability, precise steering and limiting tyre wear. The alignment on your car is set, and held, by various chassis components including your control arms, trailing arms, camber arms and tie rods. What these all have in common is that they contain stiff rubber bushes at their mounting points which are used as vibration isolators, and to give a degree of flexibility as the car rides over uneven roads and through corners. As a vehicle travels along, the chassis geometry will inevitably change, but it's the job of these bushes to hold it in place for as long as possible for the best (and safest) performance. They also have to be compliant and relatively comfortable at the same time.

The issue with these bushes is they can degrade over time. This causes cracking, perishing and the loss of their all-important stiffness, which essentially throws out the chassis geometry when static, and allows even more movement away from the optimum settings when driving. This is why – even if your static alignment has been checked – if the bushes aren't in good condition, you'll still get the adverse effects when the car is moving. Of course, bushes can also wear out under normal driving conditions over the life of the vehicle. And, with enough play in these bushes, it's not just the tyre wear and the sloppy handling, lane drifting and steering pull to worry about – you'll also get various knocks, crashing noises and steering creaks because of the excess movement, sometimes with full metal-to-metal contact.

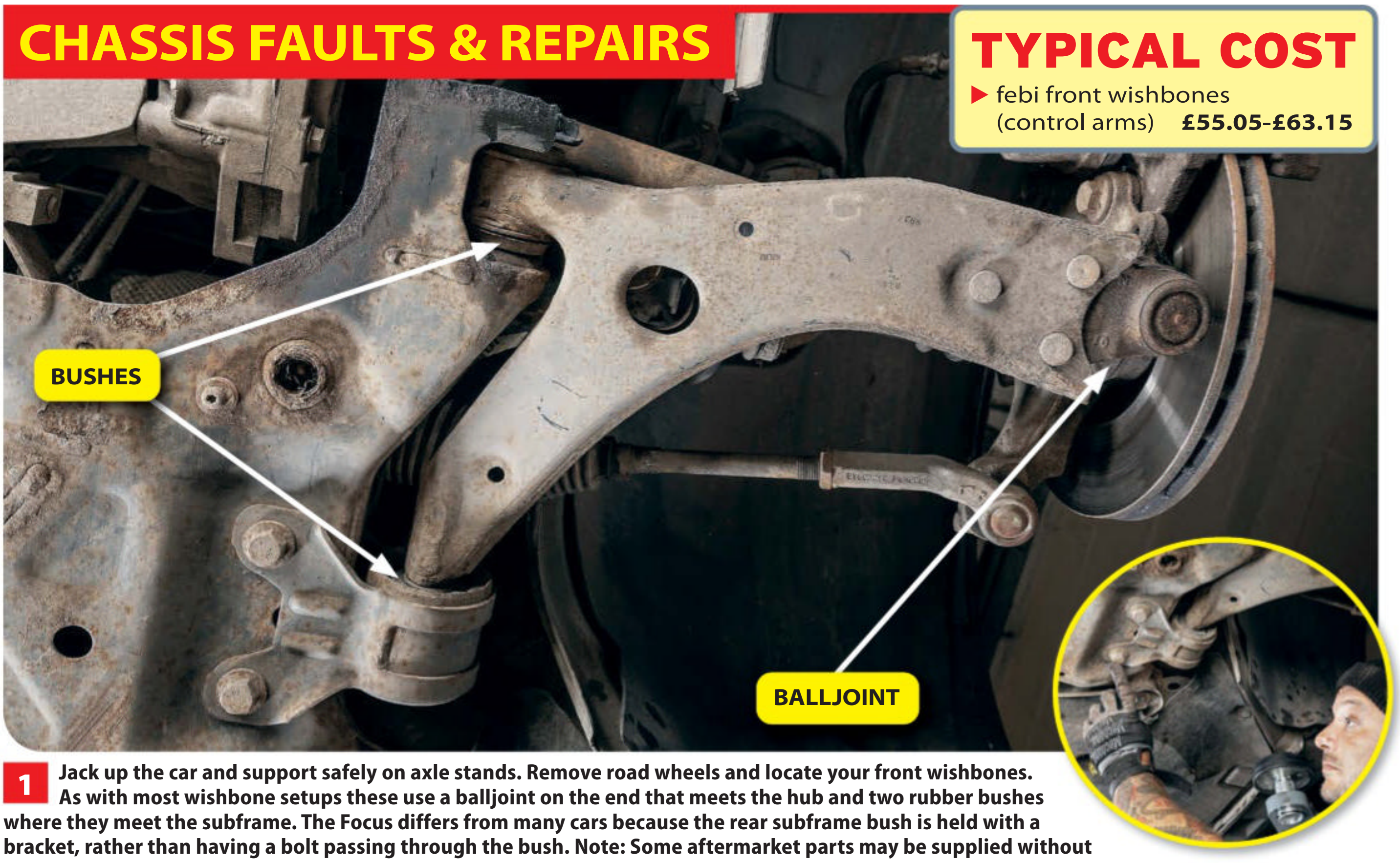
While all vehicle bushes are important, the front control arms have to stand up to the brunt of the stresses. As with most cars, these seem to wear quickly on the Focus Mk3, because they're effectively taking the inertia of the engine – through the subframe – as you drive. These will always contain rubber bushings where they're mounted to the vehicle subframe, enabling them to hold the geometry as the car moves backwards and forwards, while simultaneously allowing the control arms to move up and down with the suspension as the car moves over uneven terrain. As an added bonus, your front control arms also contain the bottom balljoint, which links the arms to the hub and allows the suspension strut to pivot when steering. These flexible joints are also notorious for wearing out, causing all sorts of knocking and creaking when driving and steering.

Replacing the front control arms on the Mk3 Focus is a straightforward task for any home mechanic though. Once you've removed the arms, both the bushes and balljoints can be changed separately if you wish, although it's far simpler (and can even be cheaper) to replace the whole arm with the components already installed. Because replacement is so commonly needed, there's plenty available.

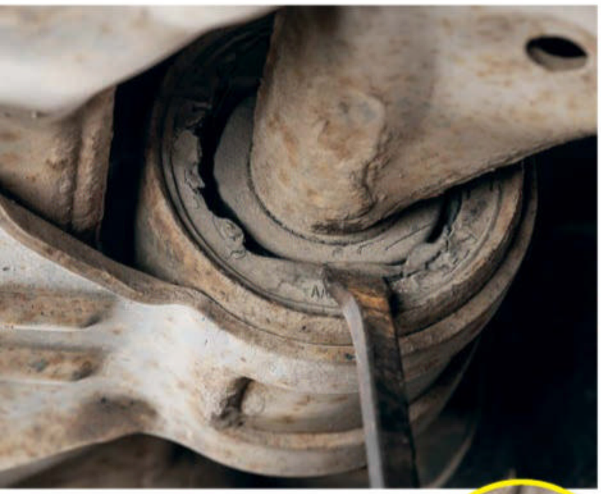
CHASSIS FAULTS & REPAIRS

TYPICAL COST

- febi front wishbones (control arms) **£55.05-£63.15**

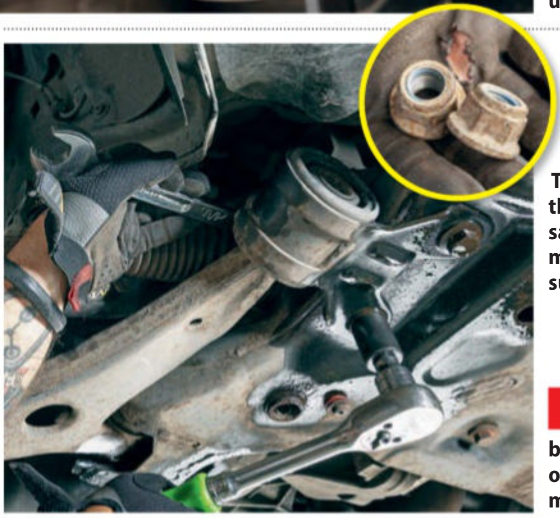


1 Jack up the car and support safely on axle stands. Remove road wheels and locate your front wishbones. As with most wishbone setups these use a balljoint on the end that meets the hub and two rubber bushes where they meet the subframe. The Focus differs from many cars because the rear subframe bush is held with a bracket, rather than having a bolt passing through the bush. Note: Some aftermarket parts may be supplied without this extra bushing and mount, so the wishbone will need to be located in the original bushing. This can be achieved without removing the bracket. Here we're changing both to ensure that all bushes are replaced. Always check with your parts supplier when ordering.



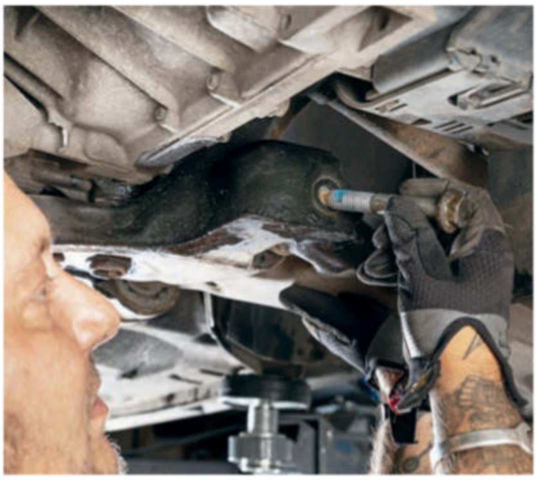
2 ◀ The condition of your wishbones can be ascertained by visually inspecting the rubber bushes and balljoint for perishing, as well as checking for excess play using a pry bar.

3 ▶ Subframe bolts are designed to be extremely tight, so we'd always recommend dousing them with penetrating lube and leaving for a few minutes for it to soak in. Then loosen the three bolts to the subframe using a long breaker bar.

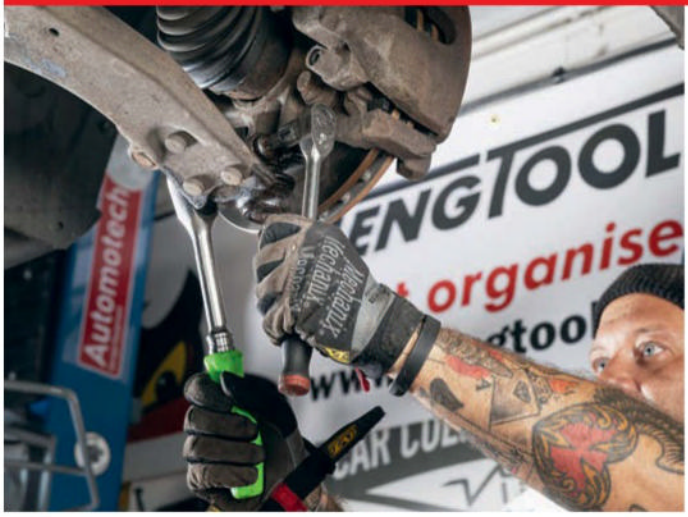


4 ◀ Starting on the rear bracket remove the bolts using and 18mm socket, holding the top nut with a 24mm spanner. There is no captive thread at the top because the bracket is sandwiched by the anti-roll bar mounting and secured to the subframe by the top nut.

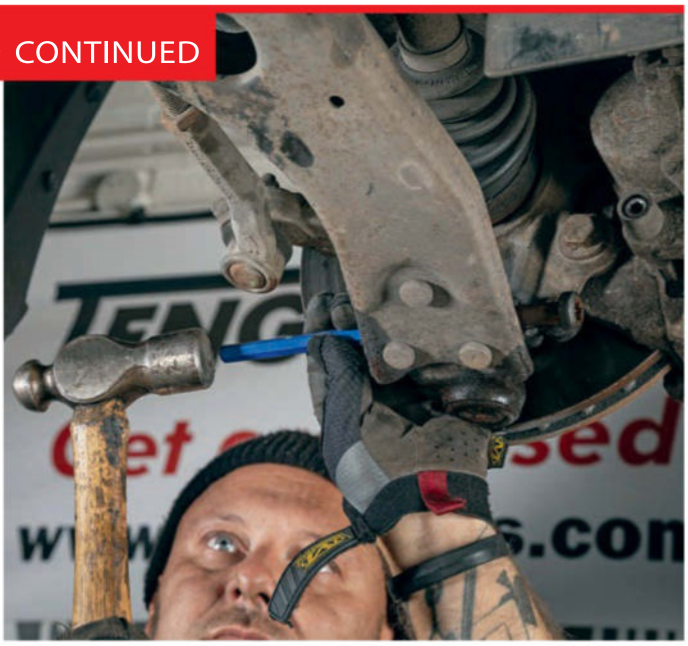
5 ▶ Remove the 18mm bolt on the front bushing, this bolt does have a captive thread on the rear side, so you'll find it much easier to remove.



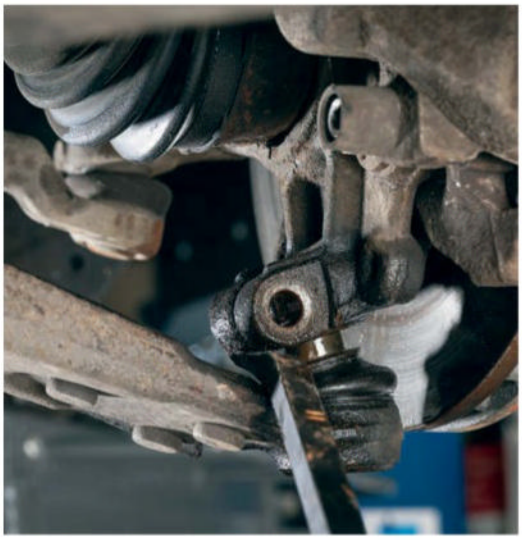
CHASSIS FAULTS & REPAIRS CONTINUED



6 Now move on to the balljoint pinch bolt. Removal requires a T55 Torx socket and an 18mm socket on the reverse. Again, it's advisable to douse this bolt in penetrating spray first. Hold the Torx socket in place firmly and remove the nut on the reverse side, this is to help ensure that the bolt head is not stripped.

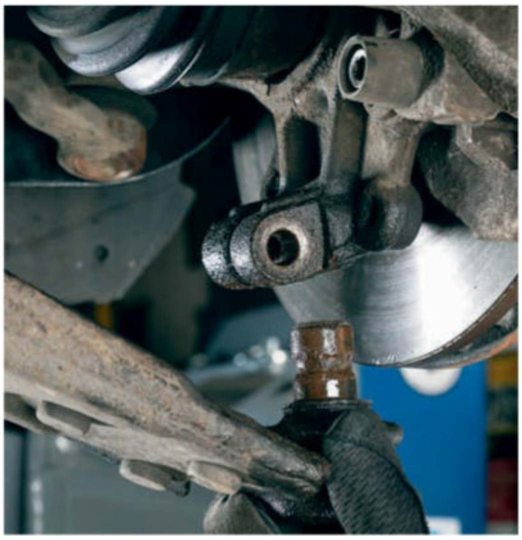


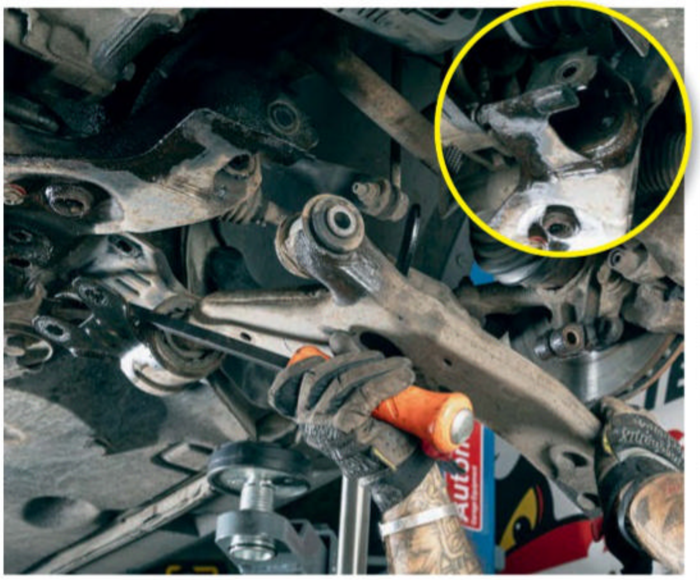
7 After removing the nut, use a punch with a slightly smaller diameter than the bolt to loosen and remove the bolt. Be careful not to damage the bolt thread, and never hammer directly onto the bolt.



8 ◀ Use a pry bar to free up the balljoint by prising down the wishbone. It will be relatively stiff, so the long bar will make this easier.

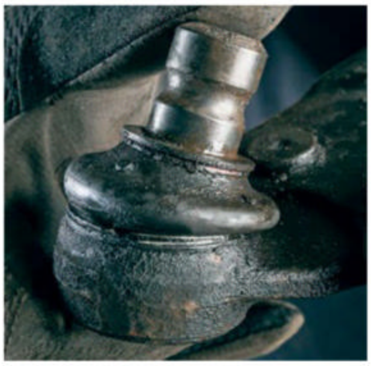
9 ▶ Fully removing the wishbone is made easier by lifting the hub assembly up a few inches using a jack. This cannot be achieved by jacking directly under the hub so instead lift the track rod end behind. To eliminate the risk of bending ensure that the jack is contacting the track rod end (or the bottom of the track rod joint) rather than the thin track rod which runs from the steering rack. Once the hub has been lifted, first pull down the wishbone to remove the balljoint.

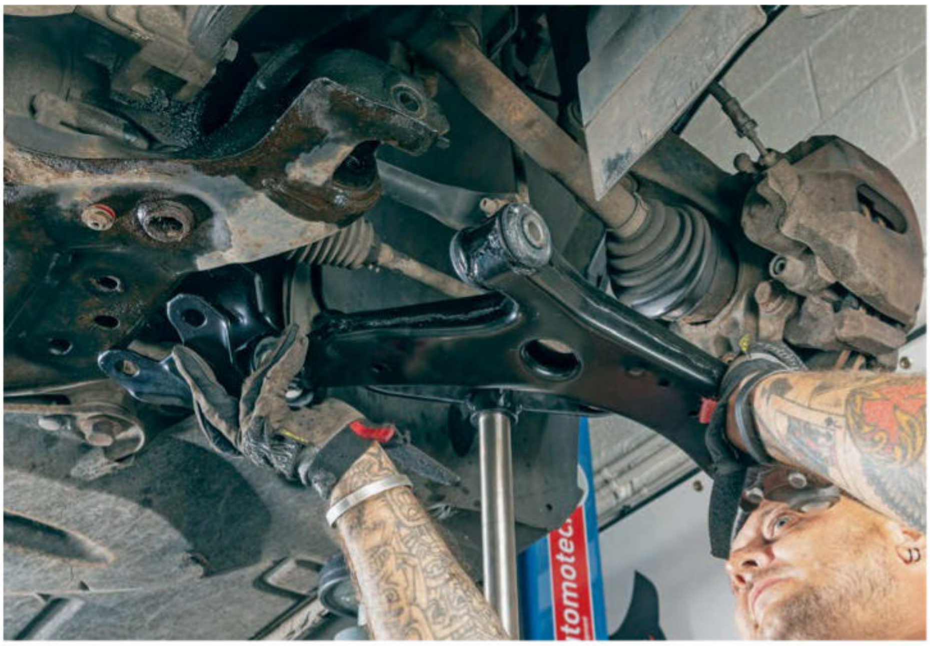




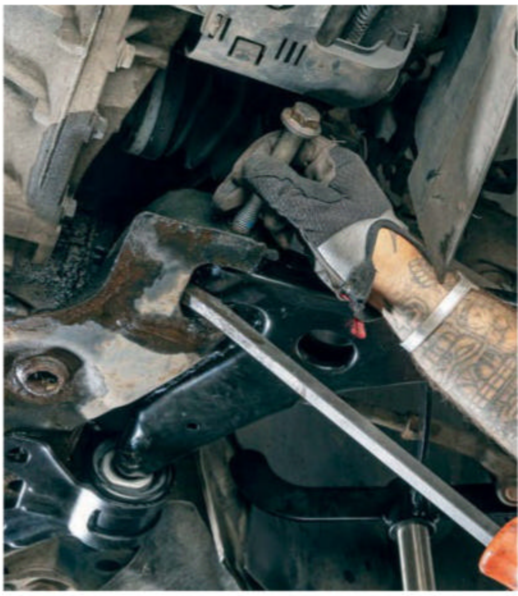
10 The whole wishbone can then be wiggled free, and off of the vehicle. If it's a little tight use a pry bar to help free it up.

11 ▶ Now is a good time to fully inspect the condition of your balljoint and bushings. A balljoint in particular should be hard to move, if it's easy, this is likely a source of knocking and shaky cornering. Bushing rubbers should be in good condition and not perished or cracked. If your bushings are in good condition (or if you are planning on fitting performance bushings) your balljoint can be replaced separately. Balljoints are commonly available, but installation does require drilling out the original rivets to bolt in the new balljoint. This can be more cost-effective than replacing the whole arm, but will inevitably be more labour intensive.

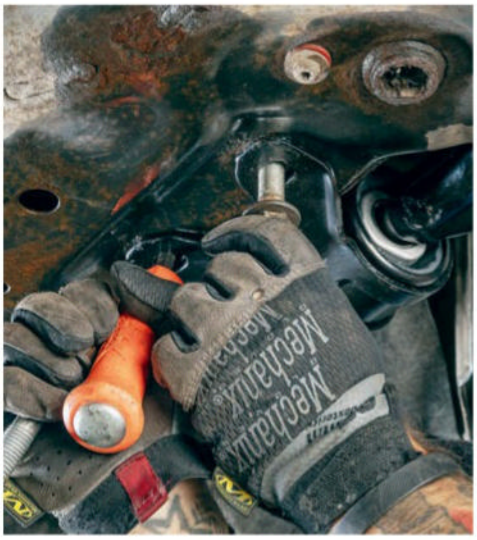




12 With the hub assembly still raised, slide your wishbone into place. Lifting the hub assembly will have also raised the anti-roll bar mounting on the top of the subframe, this will allow you to squeeze your wishbone bracket in between. Don't worry if it doesn't line up perfectly at first.

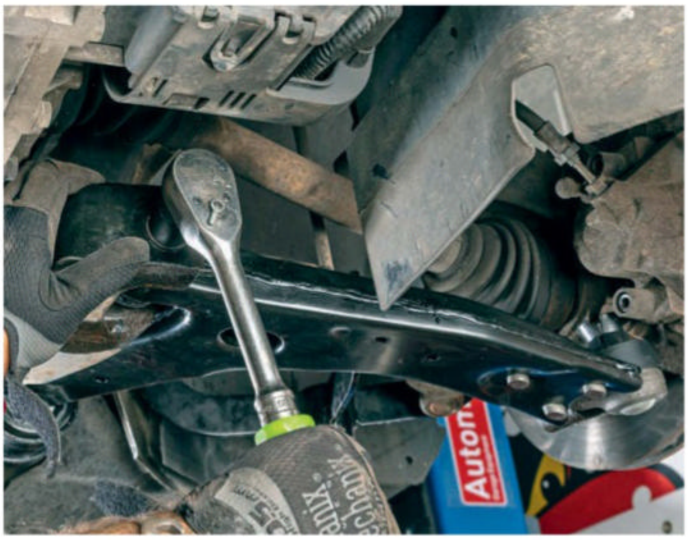


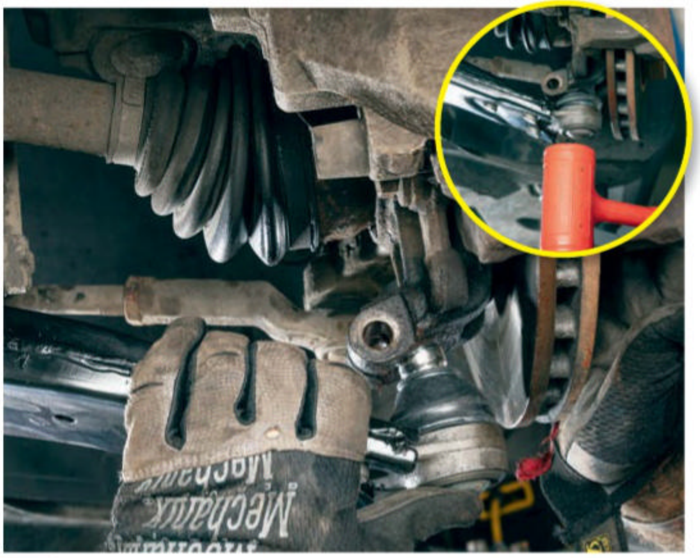
13 Now insert the front bushing bolt. Use a pry bar to move the arm slightly to ensure the bolt passes all the way through and into the thread. Tighten the bolt a little to start off the thread, but leave it loose.



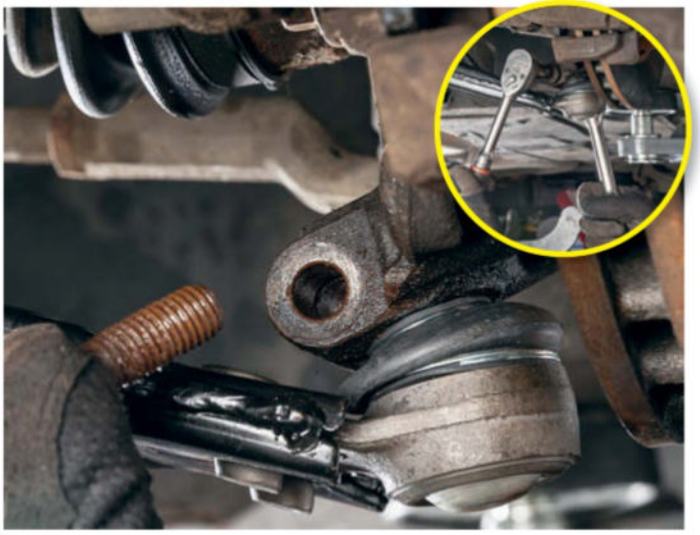
14 ◀ Replace the two bracket bolts ensuring they pass through both parts of the bracket and the ARB mounting on top. Using a small pry bar or screwdriver to wiggle the bracket helps to line everything up. Replace the nuts on top of ARB mount and tighten down until they seat.

15 ▶ Now the front bushing bolt can be tightened down to fully seat it into place, just nip it up, DO NOT fully tighten just yet.



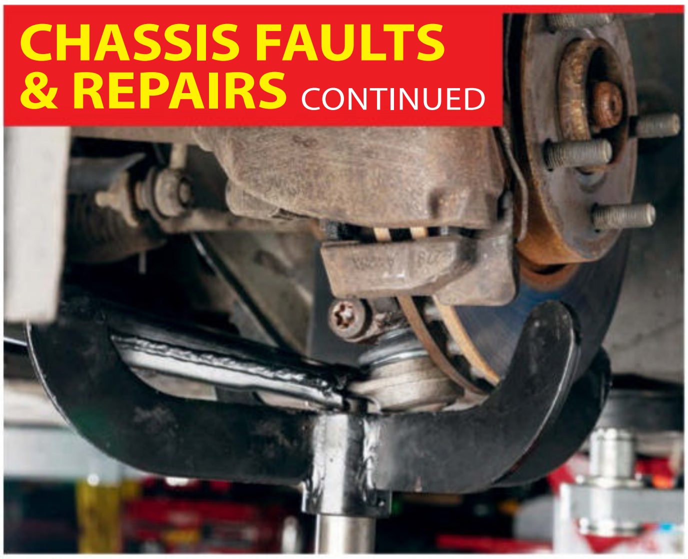


16 Line up the balljoint, let down the supporting jack so that the hub drops and push the balljoint into place until fully seated. This may require a light tap with a hammer to ensure it's all the way in.

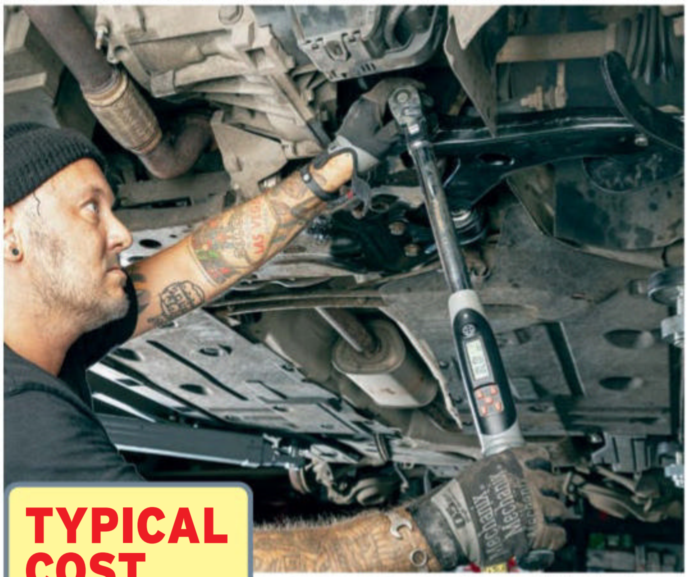


17 Replace the balljoint pinch bolt and nut, ensure the orientation is the same way that it came out, with the Torx head facing the front of the vehicle. Tighten so the bolt and nut are seated, but DO NOT tighten fully.

CHASSIS FAULTS & REPAIRS CONTINUED

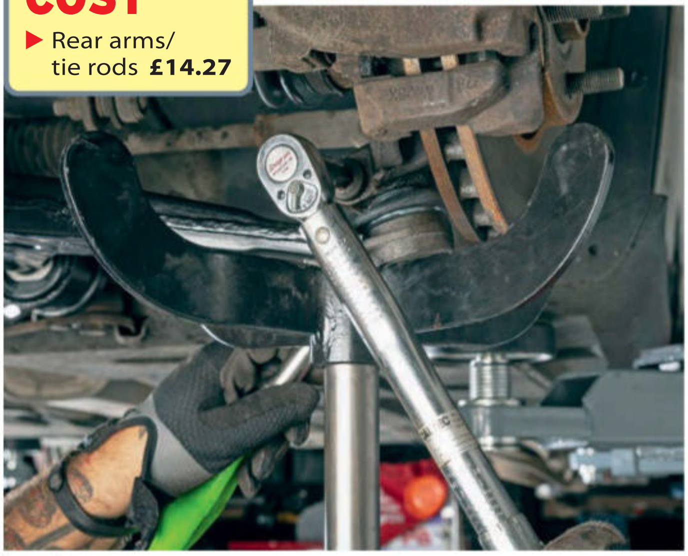


18 Before the final torquing of the fittings, raise the entire hub assembly from the bottom of the balljoint, until the hub sits at approximately the same hight as it would when the wheels are on and the car is on the ground. This is to avoid tight bolts putting excess strain on the bushes when the car is initially lowered back down.



TYPICAL COST

▶ Rear arms/ tie rods **£14.27**



19 Finally torque all bolts to their specified settings. The balljoint pinch bolt should be tightened to 83Nm. The front bushing bolt to 150Nm, and then tightened a further 90° and the rear bracket bolts tightened to 115Nm and then a further 90°.

PERFORMANCE UPGRADES

▶ Of course it may be more time efficient – not to mention a lot easier – to replace the whole control arm with a new part that already has the new bushes already fitted, but it is possible to replace single bushes, This job usually requires a hydraulic press to remove the old bushings and physically force in the new items. Using a press is also the procedure needed when upgrading to most aftermarket performance bushes – although some manufacturers – such as SuperPro (www.superproeurope.com) – now offer bushes that are split in half to make instillation easier. They also offer a whole selection of control arms and other parts with performance bushes already installed.

Performance bushes are typically constructed from polyurethane (PU) rather than rubber. This is a compound which not only lasts up to 10 times longer and will never perish, but it's engineered to be significantly stiffer to keep the chassis geometry at its optimum through extreme acceleration, braking and cornering. This offers much better handling and reduced tyre wear.

While these products obviously air on the side of performance, rather than comfort, the most reputable manufacturers produce uprated bushes for road cars that are specifically developed not to transfer an excessive amount of vibration into the cabin. Most importantly they also develop bushes with a specific Shore (or stiffness) rating for each specific location, just like you'll find in the factory setup. This means that – unlike with many of the cheaper aftermarket parts available – the vehicle isn't simply blanketed with PU of the same stiffness, which can actually be detrimental to handling.

WHEEL ALIGNMENT

▶ After replacing control arms, bushings or any other suspension component, it's important to have the wheel alignment checked and adjusted by a professional. In fact, a common problem with most vehicles (not just limited to the Mk3 Focus) is that, even if the chassis components are in good condition, the alignment can be easily knocked out or gradually changed during the course of day-to-day driving. Again, this can be especially prevalent on city cars which have to contend with curbs and potholes, along with high performance cars that are regularly driven quickly around corners.

For the Mk3 Focus in particular, many owners recommend regular alignment checks (many garages will do this for free), and we'd recommend a check at least once a year – maybe make it part of your MOT.

The problem is that wheel alignment that isn't within the correct specifications can have adverse handling effects, such and the vehicle pulling/tracking to one side. This also typically results in uneven tyre wear, which ultimately will cost you more money.

But, even before you have your alignment checked and adjusted accordingly, it's also worth inspecting all the other bushes on the vehicle for excess play and perishing. Also check the condition of your tyres – this will always give a good indication as to any problems there may be with the chassis alignment – and replace if needed. These simple checks will help ensure that the geometry isn't adjusted with bushes or tyres that are already worn out, something which will cause problems in the future.

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ON OUR PROJECT ECOBOOST

▶ In the case of our Focus project car, all the rear bushes were in good condition (with fairly limited play), with the exception of the perished rear tie-rod bushes on both sides. Again, this seems to be a common fault on the Mk3 Focus, and it was in our best interests to replace these before taking the car for a professional wheel alignment check.

Now, although these particular components help to hold the hub in place with the correct geometry (and can have an influence on rear tyre wear), we found just one of our rear tyres to be worn down to the belt so it's much more likely that our main issue was the rear wheel alignment being drastically out on the passenger side. This is relatively common and usually due to bumping curbs when parallel parking. That said, replacing these tie arms is still important for the long-term reliability of our car, and it's a quick and easy job that doesn't require a full step-by-step guide. Simply support the rear hub with a jack, remove the two bolts, replace the part and torque the bolts to 115Nm or 85 lb.ft. Replacement parts come in at around £30 for the pair.

TYRE WEAR

▶ Regular inspection of all your tyres is also crucial, and not just for uneven wear. Tyres can perish over time so always look closely at the sidewalls for signs that they may have split and degraded. For our Focus it was clear that all four had perished significantly and the only cure for this is choosing replacements. If you happen to be buying any used car, tyres should always be at the top of your checklist… and don't just kick them, either. Always look a little closer and don't forget that they can also provide a bargaining chip – they did for us! So, at the same time as the 4-wheel alignment, we treated our Focus to a brand-new set of Davanti tyres (www.davanti-tyres.com).

ALIGNMENT SETTINGS:

Focus Mk3 (hatchback)

FRONT	
Camber:	0.34° ± -1°49'/+0°41'
Caster:	4°17' ± 3°17/+5°17'
Toe:	0°12' ± 0°12' toe-in
REAR	
Camber:	-0°10 to -2°40
Toe:	+0°11' to 0°35' toe-in

Focus Mk3 (Estate)

FRONT	
Camber:	0.36° ± -1°51'/+0°39'
Caster:	4°12' ± 3°12/+5°12'
Toe:	0°12' ± 0°12' toe-in
REAR	
Camber:	-0°07 to -2°37
Toe:	+0°11' to 0°35' toe-in

Timing Belt Clinic

2016 PEUGEOT 2008 1.2 PURETECH

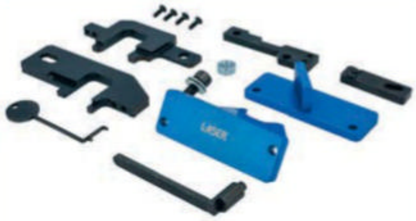
With the sump removed, we found timing belt debris inside. Black soot on the exhaust suggests it's blowing.

Bought at auction with a timing belt issue, **Rob Hawkins** watches **Mark Shipman** of AES delve into the engine of a Peugeot 2008 to extract its wet belt.

TIMING BELT CHANGE INTERVAL

Every 62,000 miles or 6 years.

TOOLS REQUIRED



- Locking tools (eg. Laser Tools **8570** for around £300)
- Hex keys: 6mm
- Side cutters
- Sockets/spanners: 8-18mm
- Torx bits: T20

TORQUE SETTINGS

Crankshaft centre bolt:	**50**Nm + **180°**
Crankshaft pulley bolts (4x13mm):	**20**Nm, **25**Nm and then **45°**
Idler pulley mounting bolt:	**20**Nm
Tensioner mounting/ centre bolt:	**20**Nm

"This was one of the worst belts I've seen," comments Mark Shipman after he has removed the swollen and frayed wet timing belt on the Peugeot 2008 shown here. We considered ourselves lucky. Had it been left any longer then we could be faced with engine failure.

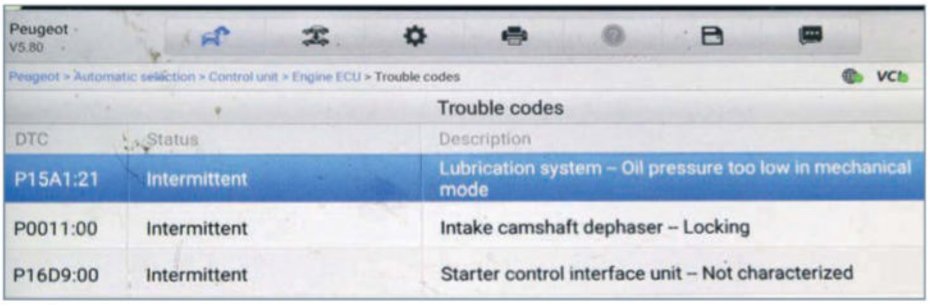
The 64,000-mile Peugeot 2008 in question was bought at auction by Editor Martyn with a known timing belt issue. It had us all wondering why it had gone to auction. Perhaps the previous owner had thrown the towel in on a seemingly long list of repairs. Whilst there were new tyres all round, all four brake discs were close to the limit, the exhaust was blowing at a couple of points (judging by the traces of black soot) and the biggest issue concerned the timing belt, which had raised a couple of fault codes.

We suspect the timing belt had never been replaced on this nine-year-old vehicle, so perhaps the potential repair and servicing costs seemed too much for a vehicle that was worth around £5000 (if it was in good condition).

We were relieved to have renewed this belt before it got any worse. Bits of it had already started to fall off and contaminate the engine oil, almost blocking the strainer for the oil pick-up pipe to the oil pump and also a small strainer inside a vacuum pump for the servo-assisted brakes! Mark has seen all of this before and recalls the horrific consequences of having no servo assistance for the brakes, not to mention potential engine failure through oil starvation. Fortunately, the fault codes that were raised helped to get the problems fixed before it was too late.

Mark stresses that it's important to check the recommended oil (viscosity and classification) for the engine with a Peugeot dealer because he has seen this differ between models, and also change. "For example, they list 0W-20, 0W-30 and 5W-30 depending on age, and this has changed too, so an engine may have had 0W-30 from new, but then four years later it might change to 5W-30."

We have covered wet timing belts before in *CM*, and Rob Marshall's major feature on this subject in the September 2024 issue included a step-by-step guide following Mark replacing the belt on a PSA non-turbocharged 1.2-litre 3-cylinder petrol engine. The 2008 seen here has the 1.2 turbocharged engine, which is easier and quicker to work on when it comes to replacing the timing belt assembly than the non-turbo version.

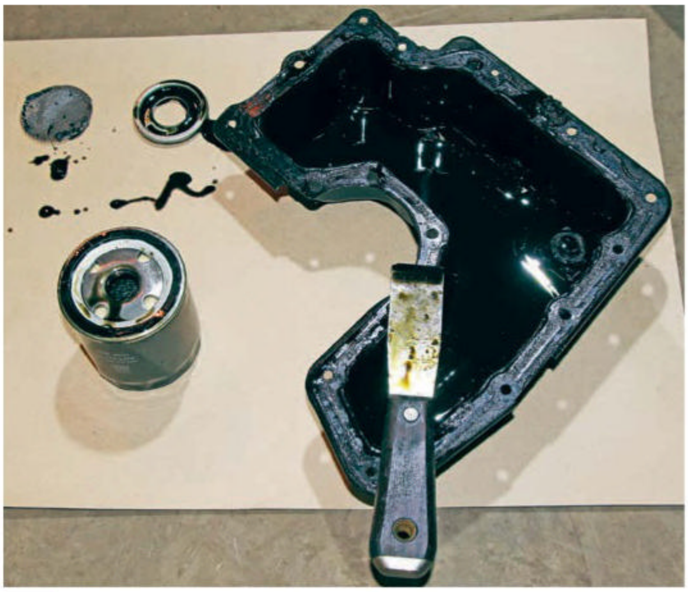


Peugeot > Automatic selection > Control unit > Engine ECU > Trouble codes

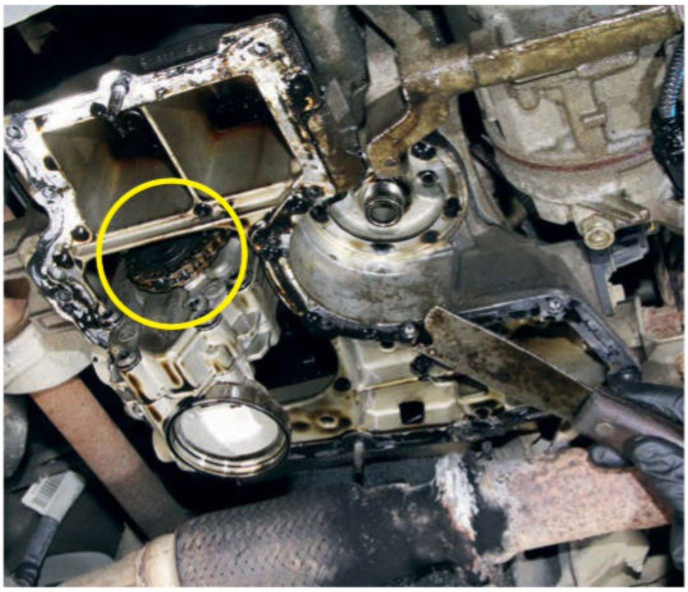
Trouble codes

DTC	Status	Description
P15A1:21	Intermittent	Lubrication system – Oil pressure too low in mechanical mode
P0011:00	Intermittent	Intake camshaft dephaser – Locking
P16D9:00	Intermittent	Starter control interface unit – Not characterized

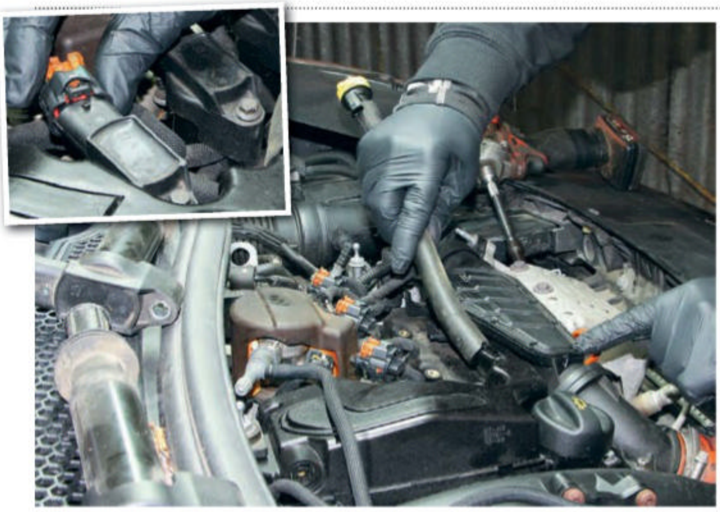
1 **Before the job started, Mark Shipman connected his diagnostic equipment (the EOBD port is inside the glovebox, behind a plastic access panel) to the vehicle and retrieved three fault codes. The top two shown here may be belt related, suggesting bits of the belt are restricting oil pressure, which has a knock-on effect for the inlet cam.**



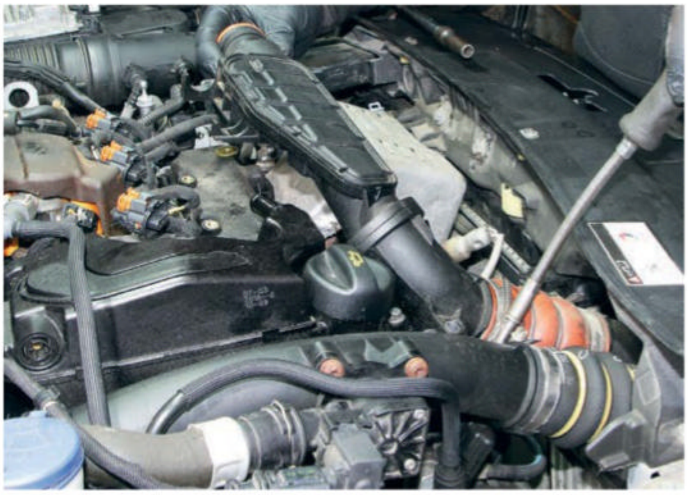
2 The engine oil was drained, then the filter and sump removed. Fragments of rubber, probably from the timing belt, could be seen inside the sump and in the gauze strainer for the pick-up, which explains the low oil pressure fault code outlined in the previous step.



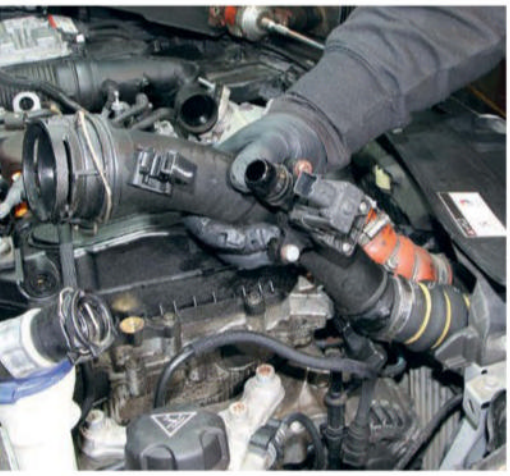
3 The bottom of the engine where the sump was fitted needed a thorough clean to remove any remains of a gasket. Looking up into the engine, we could see the rubber timing belt was still in one piece. Note the chain-driven oil pump shown here (circled).



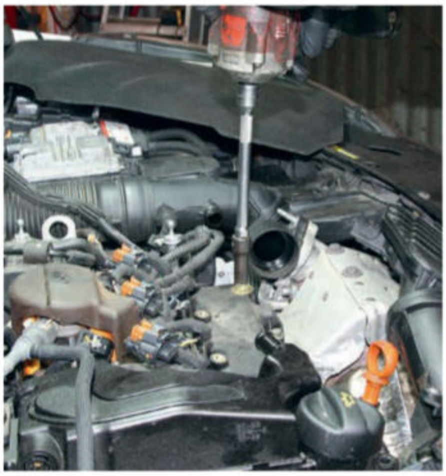
4 Mark moved to the top of the engine bay and made a start on removing the timing belt. After lifting off the upper engine cover, he disconnected the three coil packs, undid their 8mm mounting bolts and extracted them, then detached a nearby breather hose.



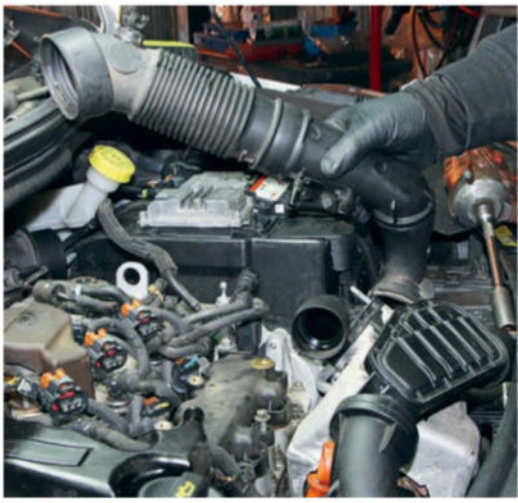
5 The air filter housing is tucked away between the engine and bulkhead, under the scuttle panel, so it doesn't need to be removed for this job. However, this resonator that's part of the induction system does need to be taken off to create more space.



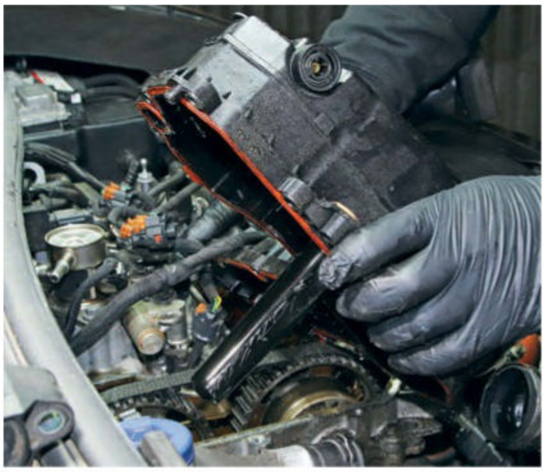
6 There's also another induction hose to remove, which is routed across the front of the engine (timing belt end) and includes a vapour heater. One end of it has a quick-release metal clip to detach.



7 Mark made a start on undoing the 8mm bolts that secure the plastic camshaft cover to the cylinder-head. There's a total of 16 to undo, but he couldn't access all of them yet until a few more parts had been removed...

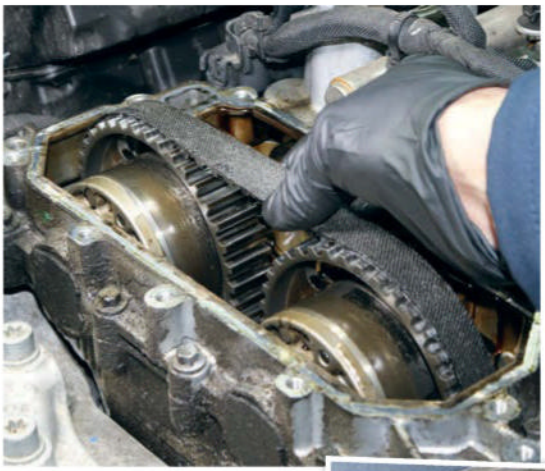


8 ...such as this induction pipe between the turbocharger and the air filter housing. It's secured with a single 10mm bolt and has some breathers attached to it.



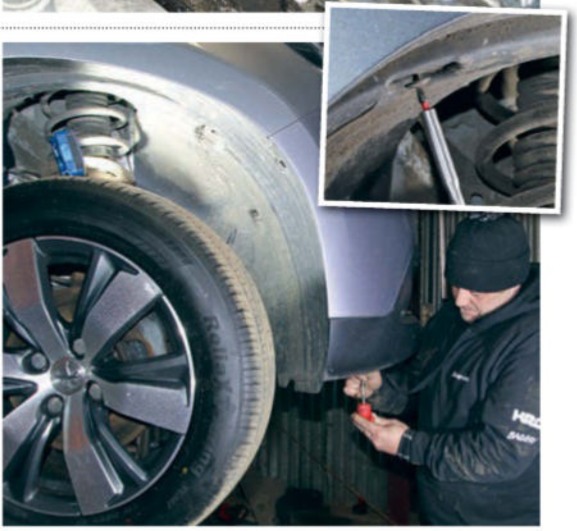
9 ◀ Finally, after undoing all 16 of the 8mm bolts that secure the plastic camshaft cover, it was released and carefully manoeuvred out – a wiring loom across the top of the engine made it a little more awkward to remove.

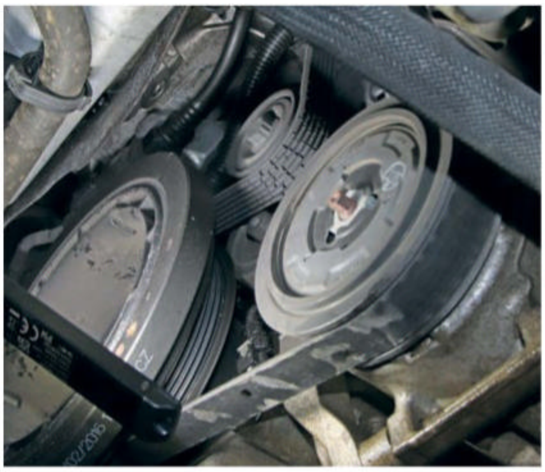
10 ▶ We could now see the top of the timing belt. Mark explained that these wet belts have a fluffy look to them when they have deteriorated. This one is no exception and judging by the debris we have found, it certainly needs renewing.



11 ◀ The back of the exhaust camshaft (closest to the front of the engine bay) needed to be locked, but there was one final piece of the induction system in the way, so it was removed.

12 ▶ We also needed to have access to the crankshaft pulley, so Mark chose to detach the front half of the offside front wheelarch liner to see if that would give him enough room. Secured with plastic trim plugs and Torx T20 screws, it was eventually released and there was sufficient space, although he did need to remove a few more pieces of undertray trim.



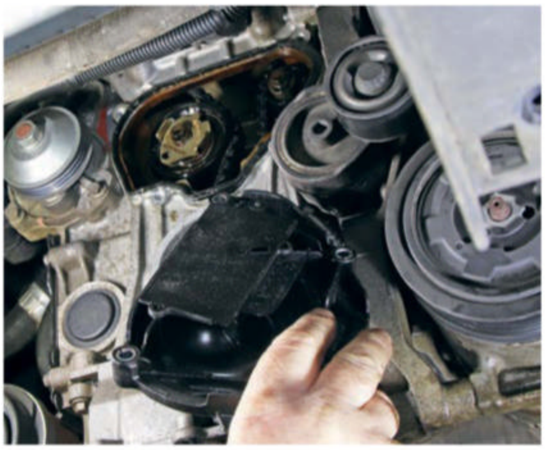


13 ◀ Looking at the condition of the main auxiliary drive belt (there are two), servicing has clearly been conducted on a shoestring or not at all. Judging by the cracks across its ribs, this belt should have been replaced a long time ago.

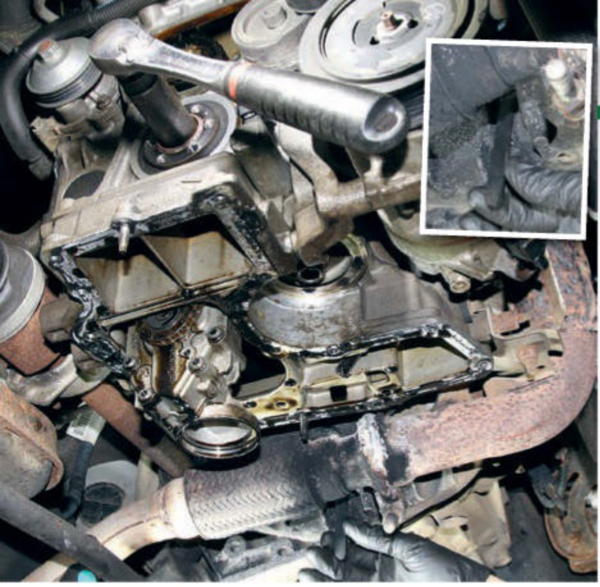
14 ▶ The crankshaft pulley was removed, which is secured with six 13mm bolts. Mark undid them, but found the two auxiliary drive belts were restricting its removal, so cut through the longer one, which was quicker than adjusting its tensioner.

15 ◀ With the crankshaft pulley removed and the longer of the two auxiliary drive belts having been cut, the shorter stretch belt that drives the water pump was easier to remove.

16 ▶ Next, a plastic inspection cover on the front of the engine was removed, which is secured with four 8mm bolts. This revealed the tensioner and idler pulley for the timing belt and enables them to be renewed.

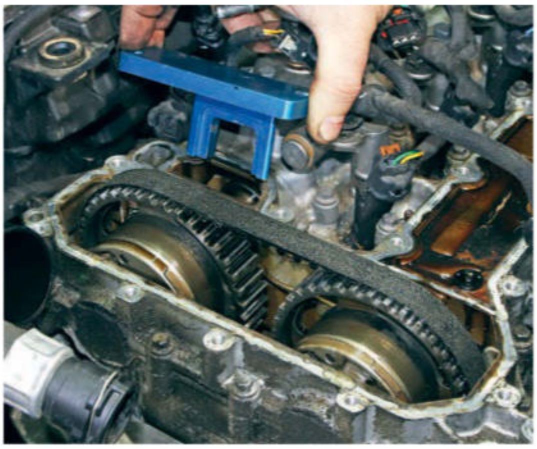


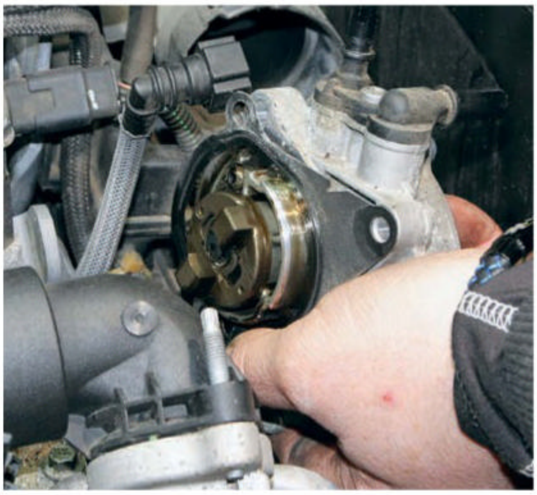
Peugeot 2008 1.2 PureTech 3-cylinder 130PS



17 ◀ We were now ready to time up the engine and fit the locking tools before removing the old timing belt. Using an 18mm socket and ratchet, Mark rotated the engine clockwise until a small locking tool could be inserted into the flywheel.

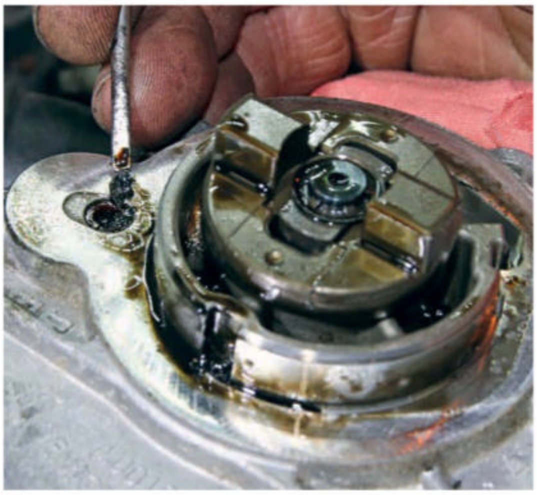
18 ▶ Returning to the top of the engine, Mark fitted another locking tool into the inlet camshaft and secured it with a couple of bolts threaded into the holes for the camshaft cover's mounting bolts.

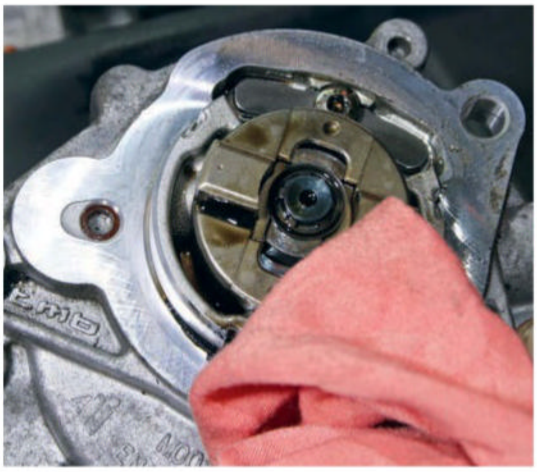




19 ◀ There was one more locking tool to fit, which was on the end of the exhaust camshaft (opposite end to the pulley). First, Mark explained that a vacuum pump had to be removed that's fitted on to the end of this camshaft. It's secured with three 8mm bolts.

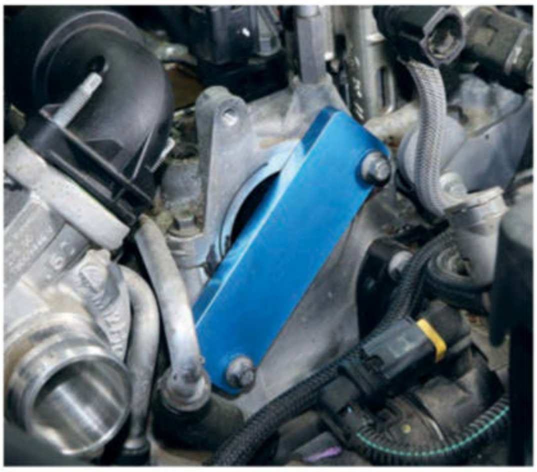
20 ▶ Looking inside the vacuum pump, Mark spotted some timing belt debris in one of its oilways and picked it out with a small screwdriver. He explained that if this gets blocked, it can result in the vacuum pump failing, which means the servo assistance for the brakes fails.





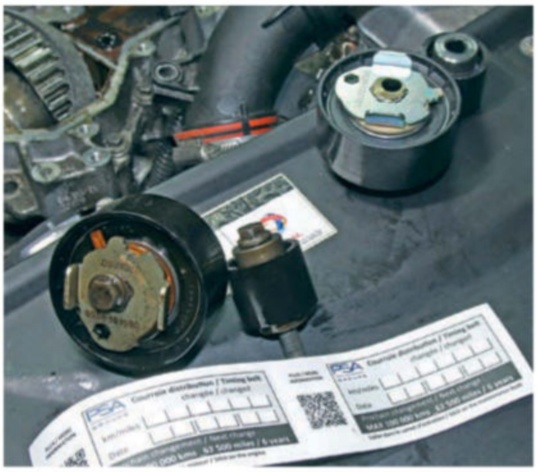
21 ◀ After cleaning out the oilway, we could now see a small mesh gauze filter inside it. Whilst this will save the pump from becoming contaminated with timing belt debris, the pump will inevitably be starved of oil, thus resulting in failure.

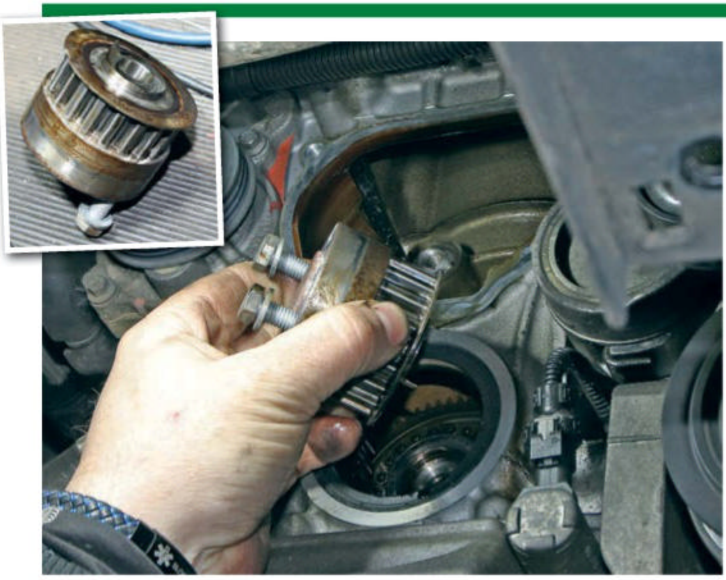
22 ▶ So, with the vacuum pump removed, we could now see the end of the exhaust camshaft and could fit the final locking tool across it. The camshaft locking tools can only be fitted in one position, so along with the flywheel locking tool, we were confident the engine was correctly timed up.



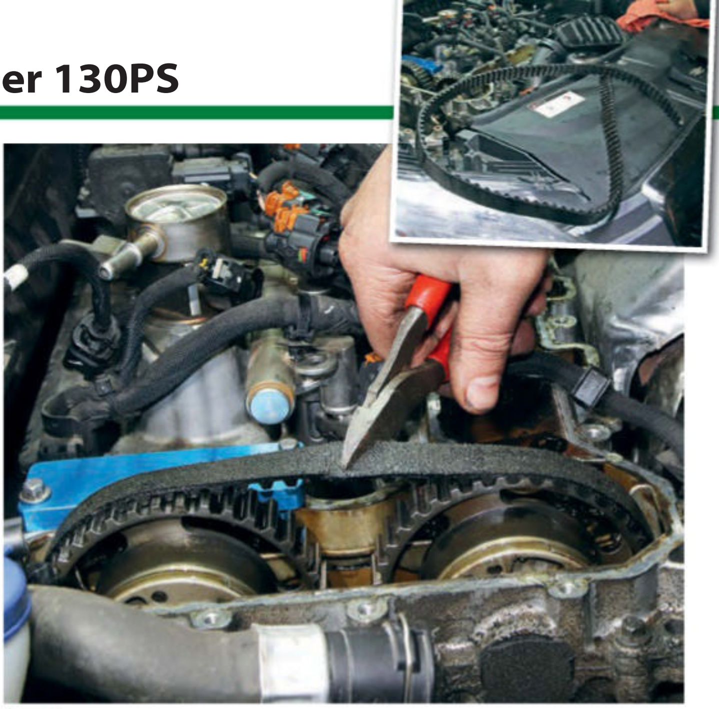
23 ◀ Armed with an 18mm impact socket and an impact driver, Mark undid the crankshaft's centre bolt, which should have been tightened to 50Nm +180°. There's a cog behind here which the timing belt fits around. We couldn't extract it yet because the belt was still tight.

24 ▶ Next, the 10mm mounting bolts for the timing belt's tensioner and its idler pulley were undone and removed, which released the tension in the belt. These should be renewed when changing the belt, and we had new OE components ready to be fitted.

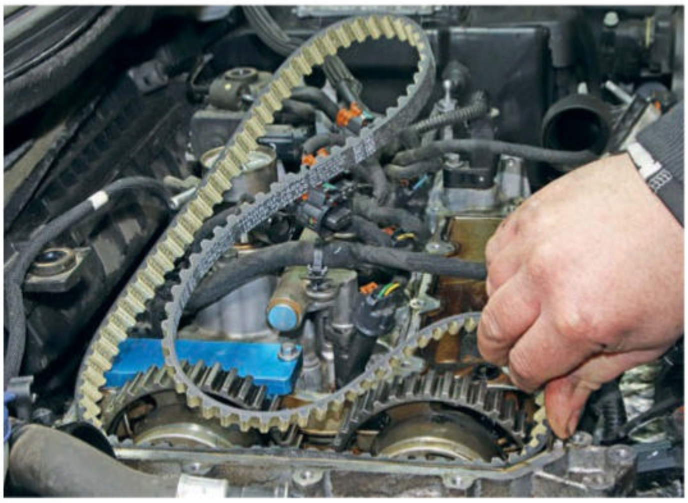




25 With the timing belt being slack, the bottom timing cog on the end of the crankshaft was easier to extract. Mark refitted a couple of the crank pulley's 13mm mounting bolts to make it easier to extract. There are two parts to it. Notice the locating lug on the back, which slots into the end of the crankshaft.

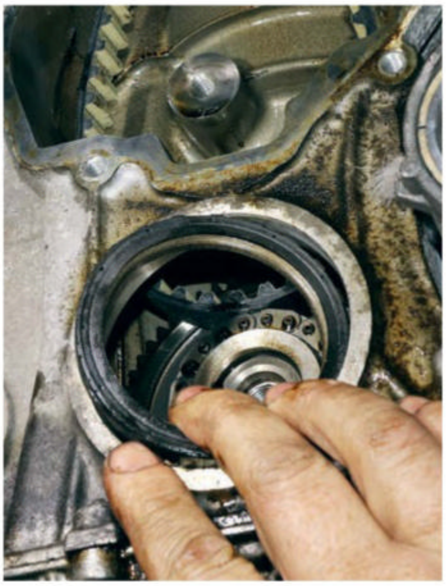


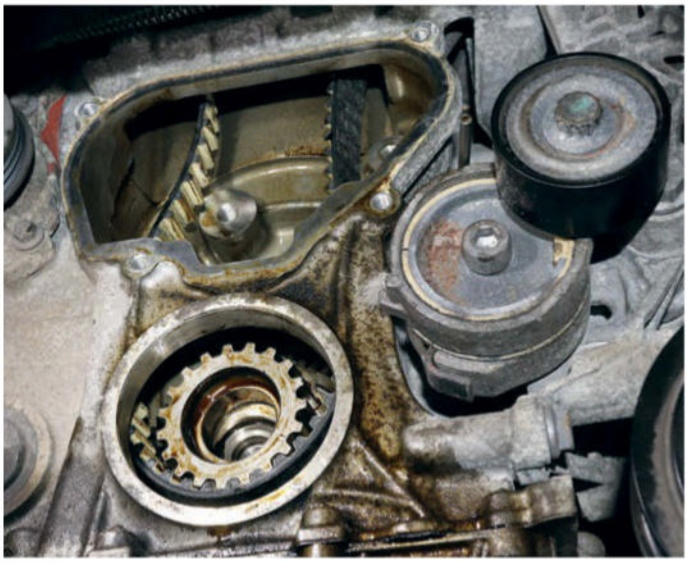
26 Armed with a pair of side cutters, Mark sliced through the top of the old timing belt, explaining it was much easier to do this than attempt to manoeuvre the belt off the camshaft pulleys. He then pulled out the old belt with relative ease.



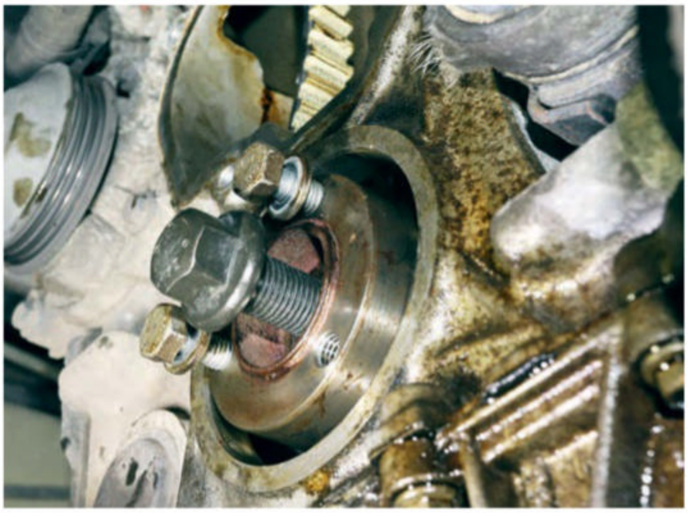
27 The new timing belt was carefully fed down the front of the engine, taking care not to trap it between the camshaft pulleys and the aluminium cover. Mark explained that there's enough space to do this.

28 ▶ Before the crankshaft timing cog was refitted and the new timing belt fed around it, Mark removed the old crankshaft oil seal. He explained it's important to avoid damaging the casing when extracting the seal, so often winds a small screw into the side of the seal to help prise it out instead of levering it out with a screwdriver.

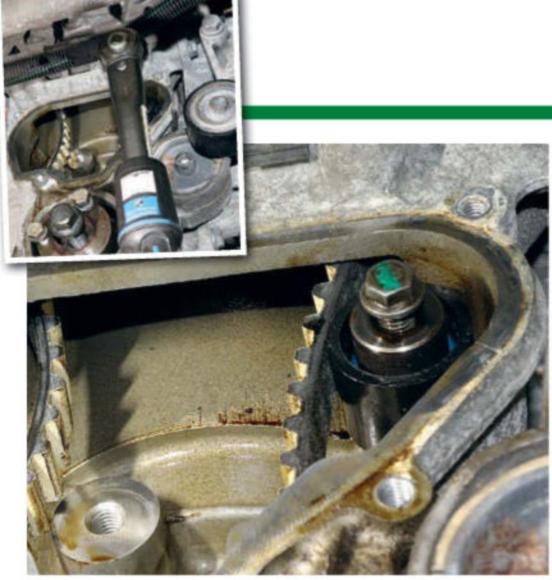




29 Refitting only the crankshaft timing cog, Mark first made sure the timing belt was fed around it. However, at this stage, the timing cog wasn't connected to the crankshaft – it was still floating.



30 The other half of the assembly that fits on to the end of the crankshaft could now be fitted, ensuring the locating lug or drive for the oil pump was fully seated. With no woodruff key for the crankshaft, this is an awkward part of the job. Mark fitted a new crank bolt with thread lock, but didn't fully tighten it at this stage.



31 ◀ A new idler pulley was fitted, tightening its old 10mm bolt (fitted with thread lock) to the recommended 20Nm. There was now only the tensioner that needed to be fitted to complete the timing belt assembly. Mark made sure the top of the belt was fitted around the camshaft pulleys.

32 ▶ The new timing belt tensioner was fitted with its old 10mm bolt and a little thread lock, ensuring the timing belt was correctly wrapped around it. Using a 6mm Hex key and a 10mm spanner, the tensioner was adjusted to line up a pointer with a groove, before tightening the mounting bolt to 20Nm.

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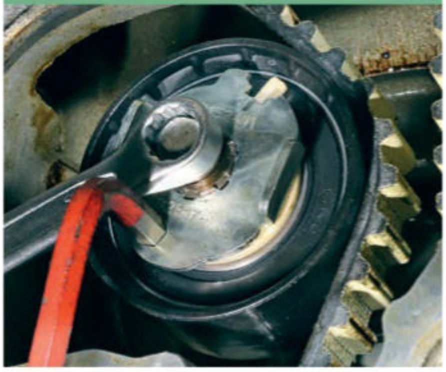
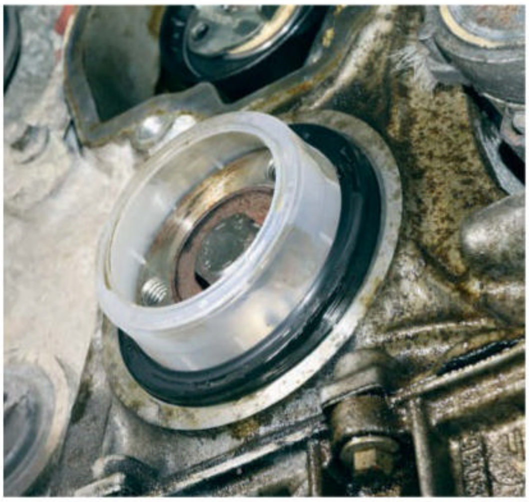
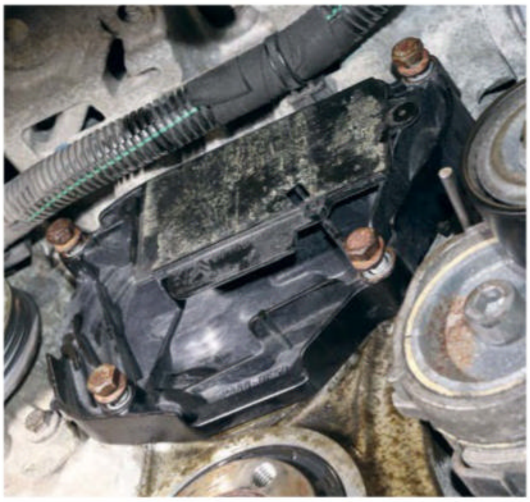
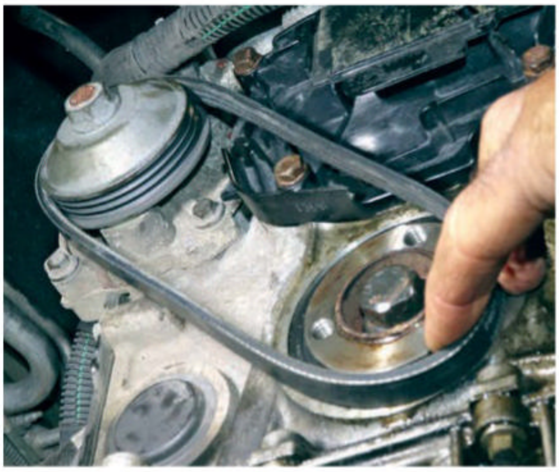




33 ◀ With the new timing belt fitted, the timing tools were removed, the engine was manually turned by two revolutions on the 18mm crank pulley bolt, then we checked to see if the timing tools could be refitted – they could. So, the centre bolt was tightened to 50Nm +180° and a new crank seal was fitted using a plastic locating tool.

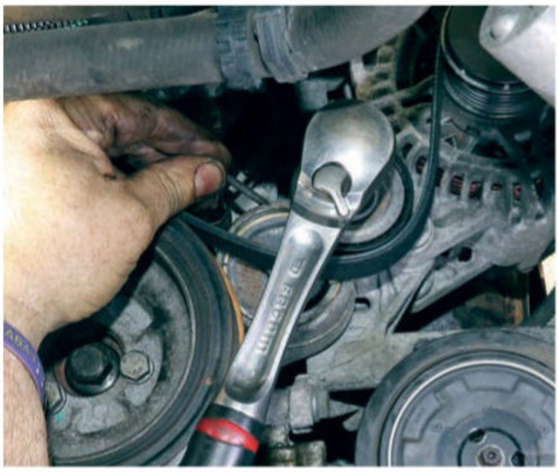
34 ▶ The inspection cover that was removed in *Step 16* can be refitted, providing it's in good condition, although it's worthwhile cleaning the mating surface and adding a bead of sealant for an oil-tight fit. New covers are available.





35 ◀ The stretch belt between the water pump and crankshaft should ideally be fitted before refitting the crankshaft pulley. Mark wound the belt on to the crank pulley whilst trying to locate one of its four 13mm bolts.

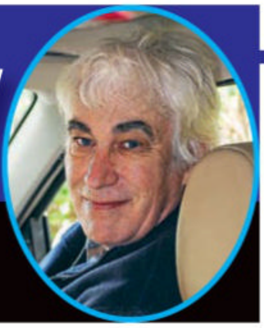
36 ▶ The remaining three 13mm mounting bolts for the crankshaft pulley were refitted (a smear of thread lock was applied to the threads of all these bolts), tightening them to the recommended 20Nm, then 25Nm and finally 45°.



37 ◀ There's a tensioner for the larger auxiliary drive belt, which can be locked with a pin to help fit the new belt. Once located, Mark adjusted the tensioner and extracted the pin.

38 ▶ After refitting the sump and a new engine oil filter, he returned to the top of the engine to refit the remaining parts before refilling with 3.5 litres of 5W-30 fully-synthetic engine oil (conforming to OEM part number FPW 9.55535/03), then running the engine.

Dealer's Diary



Peter Simpson provides us with an insight into the automotive sales trading world – and beyond.

Close case in court

▶ As this issue went to press, Close Brothers' Supreme court appeal against last year's Court of Appeal decision was getting underway. The hearing was expected to take about three days, but a final decision isn't expected until the summer at the earliest. This case revolved around claims that customers had been mis-sold car finance due to being unaware that the dealerships involved were paid a commission for selling finance, and the amount that they received. This decision was unexpected and caused mayhem within the car finance industry. For several weeks last year, many providers, including some manufacture-backed schemes, put all car finance on hold while procedures and documentation were revised.

There are fears that if the appeal court decision is upheld, and the mis-selling is confirmed, compensation payable by the finance industry as a whole, and including household names such as Lloyds Bank, Barclays Bank and Santander could be as high as £44Bn, due to historic mis-selling going back many years. Close Brothers have been especially hard-hit, as car finance makes up a significant percentage of their overall turnover. Though agreements being signed now comply with the changes required by the court of appeal decision.

Those giving evidence include the Financial Conduct Authority and the National Franchise Dealers Association. However, the treasury's application to make submissions has been rejected by the court.

Many in the finance industry and motor trade are awaiting the court's decision, and hope for a speedy resolution. Meanwhile, Close Brothers have certainly been hit hard financially; figures for the six months to the end of January 2025 released on March 18 show a pre-tax loss of £103.8million, compared to a profit of £87million during the six months to January 2024. The share price dropped by 14% on this news, and the firm have, reportedly, set aside £165million to settle claims in the event that the Supreme Court backs the original Court of Appeal decision.

I do wonder, however, if that will be enough – this case really could be the PPI mis-selling scandal all over again.

A red herring

▶ Sometimes as a dealer, you'll get a slightly odd contact from a customer, especially if you are brave enough to advertise it on Facebook marketplace. In most cases of course there's a hidden agenda of trying to justify a lowball offer, but what can possibly be the thinking behind an initial contact informing the seller that for X, Y or Z reason, they are not interested in buying? I genuinely don't get why anyone would waste their time doing this.

Yet it happened. I've had it a few times when I've listed a car with disclosed defects, and people have told me they won't buy it because of those defects. I heard about another case the other day – the car in question was a 2013 Fiat 500, listed at £3000. A first contact from someone reading the online listing went like this:

"I was interested in your car until I read that it has no service history. That's a red herring for me I'm afraid, a car without any service history, even though it's just been serviced as the service history is verification of its mileage so sorry I'll have to pass."

I presume by 'red herring' they actually meant 'red flag.' Anyway, the seller responded thus:

"OK, so why did you message then? MOT is verification of mileage. And HPI checks."

To this the would-be non-buyer responded with:

"And it's had an accident been repaired."

So clearly, they had no intention of buying. Absolutely fine, but why on earth did he feel the need to message the seller to say they wern't going to buy?!

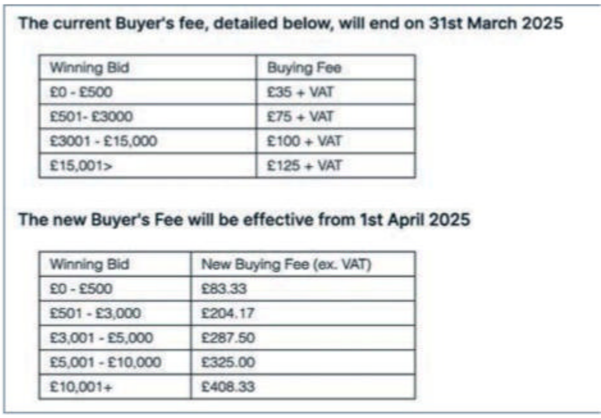
A similar thing happened to me a couple of years ago with a Rover 75 Connoisseur SE diesel estate. It was basically good; decent spec (including the highline sat-nav), low ownership, low mileage and extremely solid bodywork, having been in storage between 2014 and 2020.

However, for reasons unknown, someone had started repainting the roof using aerosol, but given up half-way along, meaning the whole roof now needed painting properly. All this was of course fully disclosed and photographed. For someone with the skill and equipment to do this themselves, the car was a cheap way into a good 75, though the cars value as was compared to its value when done meant it probably wasn't worth paying to have done professionally.

Unsurprisingly, the car sold without difficulty, and looking online it's still on the road today, having passed a second MOT since mine with only two trivial advisories. My first enquiry, however, was from someone who felt it necessary to tell me that he wanted a Rover 75 estate but wasn't going to buy mine because the roof needed painting.

I really don't get this at all!

Rising auction fees



The current Buyer's fee, detailed below, will end on 31st March 2025

Winning Bid	Buying Fee
£0 - £500	£35 + VAT
£501- £3000	£75 + VAT
£3001 - £15,000	£100 + VAT
£15,001>	£125 + VAT

The new Buyer's Fee will be effective from 1st April 2025

Winning Bid	New Buying Fee (ex. VAT)
£0 - £500	£83.33
£501 - £3,000	£204.17
£3,001 - £5,000	£287.50
£5,001 - £10,000	£325.00
£10,001+	£408.33

▶ These days, auction buyer's premiums can vary a lot, but they're usually a lot more than the fairly modest charges of £50-£150 once levied. Back then, the fee was usually referred to as a Title Indemnity, and was intended to be an insurance premium to cover the buyer should a car turn out to have been stolen or still subject to finance. By law, auctions had to cover buyers who bought cars that weren't the vendors to sell, though in practice auction developed robust ways of checking the status of everything offered, claims and payouts were extremely rare, and the Title Indemnity became in practice simply an extra source of income for the auction. The auctions running costs were supposed to be covered by the commission paid by the seller, which really, was as it should be, because an auction's primary responsibility is always to the seller.

Over time however as the small independent auctions competed with the 'big boys' for the best ex-company and part-ex stock by trimming commission charges, responsibility for paying the auctions started shifting from seller to buyer, and Title Indemnities were replaced with Buyer's Premiums. Few people noticed the name change, but over the next few years some did notice that the level of Buyer's Premium started to rise. Then, about ten years ago (I think...) BCA suddenly raised the level of premium massively, to the extent that the fee on, say, a £4000 car was around £400. This was because they'd switched charging most of their running cost to the buyer, and selling dealers were often given a near-net deal with little or nothing deducted from sale proceeds. In fact, rather than deducting commission, these days auctions sometimes pay the most desirable vendors for the privilege of offering their stock.

Since then, some, but by no means all, other auction houses have followed this trend towards loading their charges on to buyers. The latest, it seems, is Sytner Auctions. This is basically the in-house facility for disposing of group part-exchanges, though it is sometimes also used for disposal of 'overage' stock (cars that have been on the forecourt for too long) and sometimes specialist vehicles where its thought that competing buyers will result in a better price than would be obtained from a fixed-price forecourt sale.

As you'd expect, there's often a wide range of stock on offer; when I looked on March 31 the cheapest car was a £680 56-plate Honda Accord, the dearest a £70,000 Bentley. They seem to have, typically, between 100 and 200 cars listed, and the procedure is similar to eBay – vehicles are listed for a fixed time and the top bid at the end wins, subject to meeting any reserve that has been set. According to the online information at https://auction.sytner.co.uk/ buyers are also able to test-drive a car when they arrive to collect it, and 'negotiate' over undisclosed defects.

Anyway, from April 1, Sytner Buyer's Fees have increased significantly. For cars up to £500 they've gone up from £35 to £83.33; for £501 to £3000 from £75 to £204.17; and charges of £100 from £3001 to £15,000, and £125 from £15,000 up, have been replaced £287.50 from £3001 to £5000, £325 from £5001 to £10,000 and £408.33 from £10,001 upwards. All these prices are plus VAT.

I'm not 100% sure how I view this. On the one hand these are hefty increases, and given that the whole thing is online, I really can't see that the running costs can be that high. And given that the cars being offered all belong to Sytner, the title indemnity justification for an additional charge doesn't really apply. But on the other hand, these new charges are by no means the highest I've seen recently. They are also fixed fees within a price range – so for example and totally transparent. Try getting a list of BCA's Buyers Fees before you bid – I've never been able to obtain one!

Police Marker?

▶ I heard a slightly strange story recently. An independent dealer bought a car privately from a couple – lady arrived with her husband and said they wanted to sell as he was no longer driving. Dealer did all the usual checks; everything was fine and he bought the car. He then sold it the week before Christmas.

The buyer came back in the new year and said they have been pulled over three times in 10 days and breathalysed over Christmas. They suspected there was a marker on the car for drink driving. The new owner has contacted the police but "got nowhere" and were stopped again in January. Customer then claimed this meant the car wasn't fit for purpose and demanded a full refund.

There are, of course, numerous possible hidden agendas here. For example, is it the new owner that has the drink-driving reputation and being stopped because of that? Or maybe the pre-Christmas stopping was simply part the normal police clamp-down. Or perhaps it is a case of a marker not being removed.

From the dealer's perspective however, the important thing is that this is, ultimately, a matter between the new owner and the police, and nothing whatsoever to do with the dealer. I understand that the dealer offered to buy a cheap personalised registration – some of these can be bought for £50 or so – if the customer paid the transfer fee. Whether that happened, and/or whether it had the desired effect I've no idea.

Disc-gusting!

▶ Dealer sold a 2014 13,000-mile Suzuki Alto. Overall condition was exactly as would be expected with that mileage. As part of the pre-sale preparation, they put a new test on it, which came back with an advisory for brake disc wear. Customer spotted this online so rang to say he "wasn't happy" about it. The dealer responded that they were of course going to change them before delivering the Alto. This was the customer's response:

"That is not the point. The Alto I bought six years ago with 12,000 miles did not need discs. Why does this one?"

How would you have responded in this situation? One option would have been to try and explain why low mileage cars that are driven mainly in town have more brake applications per mile than cars used mainly on long trips. You could point out the effects of corrosion on little-used brake discs.

Alternatively, you could perhaps decide that this particular deal might be one that you are better off not doing.

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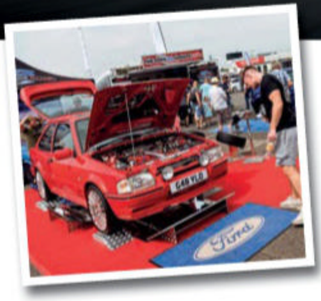

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CAR MECHANICS DIESEL SUPPLEMENT

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Keeping it alive

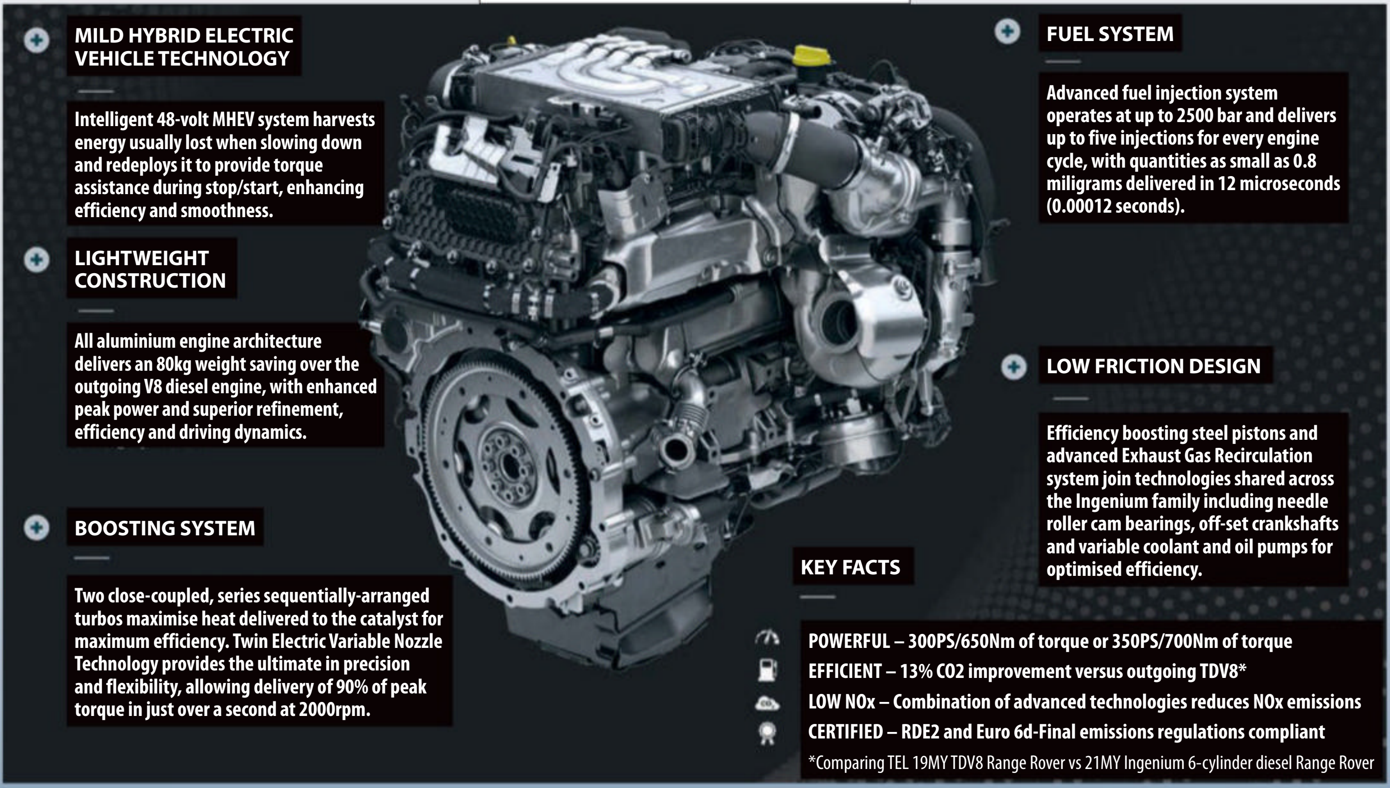
Once popular, the sales of new diesel cars have experienced a significant decline in recent years, but what about used models? **Chris Randall** takes a look at some, plus lots more about diesel engines and their maintenance.

If you keep up with the latest car news you'd no doubt have seen that diesel appears to be in terminal decline. It wasn't always that way, of course, and while cars improved and sales rose over the decades oil-burners would receive a substantial boost courtesy of the last Labour government. A focus on reducing CO_2 emissions saw diesel cars benefit from lower fuel duty and VED rates, and sales soared in the following years with 56% of new cars sold in 2011 being diesels.

But CO_2 was only one part of the equation, other emissions such as nitrogen oxide (NOx) proving more problematic, and following Volkswagen's 'dieselgate' scandal in 2015 the enthusiasm for diesel started to wane. It cast something of a shadow, buyers became suspicious and sales began a drop that continues today. New car sales figures from The Society of Motor Manufacturers & Traders (SMMT) for October 2024 show that diesel sales were down 20.5% compared to the same month in 2023 with the market share dropping from 7.3% to 6.2%. Similarly, Year to Date figures show diesel sales down by 12.8%. The effect is such that a number of carmakers have stopped offering diesel-powered cars altogether - amongst them the likes of Volvo, Honda, MINI and Vauxhall – and it's a situation that isn't going to be reversed.

Many owners continue to enjoy the economy benefits, and for anyone covering a high annual mileage opting for a diesel still makes a lot of sense. But there's no escaping the fact that times

From mid-2020, JLR launched this Ingenium 3.0-litre 6-cylinder diesel engine, featuring twin variable-geometry turbo technology and a 48V mild-hybrid system.



MILD HYBRID ELECTRIC VEHICLE TECHNOLOGY

Intelligent 48-volt MHEV system harvests energy usually lost when slowing down and redeploys it to provide torque assistance during stop/start, enhancing efficiency and smoothness.

LIGHTWEIGHT CONSTRUCTION

All aluminium engine architecture delivers an 80kg weight saving over the outgoing V8 diesel engine, with enhanced peak power and superior refinement, efficiency and driving dynamics.

BOOSTING SYSTEM

Two close-coupled, series sequentially-arranged turbos maximise heat delivered to the catalyst for maximum efficiency. Twin Electric Variable Nozzle Technology provides the ultimate in precision and flexibility, allowing delivery of 90% of peak torque in just over a second at 2000rpm.

FUEL SYSTEM

Advanced fuel injection system operates at up to 2500 bar and delivers up to five injections for every engine cycle, with quantities as small as 0.8 miligrams delivered in 12 microseconds (0.00012 seconds).

LOW FRICTION DESIGN

Efficiency boosting steel pistons and advanced Exhaust Gas Recirculation system join technologies shared across the Ingenium family including needle roller cam bearings, off-set crankshafts and variable coolant and oil pumps for optimised efficiency.

KEY FACTS

POWERFUL – 300PS/650Nm of torque or 350PS/700Nm of torque
EFFICIENT – 13% CO2 improvement versus outgoing TDV8*
LOW NOx – Combination of advanced technologies reduces NOx emissions
CERTIFIED – RDE2 and Euro 6d-Final emissions regulations compliant

*Comparing TEL 19MY TDV8 Range Rover vs 21MY Ingenium 6-cylinder diesel Range Rover have changed, and anyone looking to buy a brand new diesel car faces a much-reduced choice compared to a few years ago. As for the used car market, well that's a different matter and there's still a wealth of models out there offering fuel-sipping motoring for not a lot of money. We'll be exploring some of those cars a little later, focusing on models from 2010 to 2020 – both those that have a strong reputation for reliability and those that need a little more caution before you take the plunge.

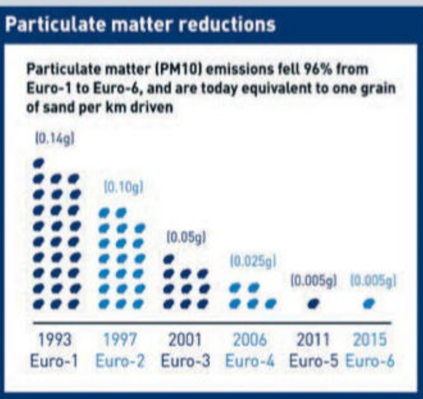
For now, though, it's time to take a closer look at the tech aspects of the diesel engine, what you need to know, and how you can keep them trouble-free. And we'll start with the subject of emissions.

Euro Emissions Standards

Most of us are familiar with the emissions ratings given to engines – Euro 5, Euro 6, etc. They apply to petrol as well as diesel motors and the system dates back to 1992 when the Euro 1 standard was introduced. That was the point when catalytic converters effectively became compulsory and were a vital component if carmakers were to meet the emissions targets for a number of pollutants, including carbon monoxide, hydrocarbons and particulate matter.

We are currently on Euro 6d (introduced from January 2021) and the standards have become increasingly stringent over the years; Euro 7 scheduled for introduction this year will be tougher still, much to the concern of some carmakers who say it will add unreasonable cost to each new car. The regulations have certainly provided engineering challenges, bringing with them added cost and complexity for today's motorists. But there's no doubt that it's contributed to improvements in air quality which can only be a good thing, and you only have to look at the numbers below to see just how much stricter the regulations have become.

Particulate matter reductions



Euro 1 diesel	Euro 6 diesel
CO: 2.72g/km	CO: 0.50g/km
HC & NOx: 0.97g/km	HC & NOx: 0.17g/km
	NOx: 0.08g/km
PM: 0.14g/km	PM: 0.005g/km

There's another way that the Euro standards impact the drivers of diesel cars, and that's the introduction of low emission or clean air zones in various parts of the UK. One of the largest is London's ULEZ and if you want to drive a diesel into the zone without paying the £12.50 daily charge then it will need to meet the Euro 6 standard. Essentially, that will mean a car built after 2015, whereas for petrol models it's Euro 4 which is mostly post-2005 models although some earlier ones do comply. It's not just London, of course, as cities including Bath, Birmingham and Bristol have similar schemes (although Bath doesn't include private cars at present), while Glasgow's Low Emission Zone is even stricter; again, it's Euro 6 for diesels but non-compliant cars can't enter at all, so there's no option to pay a charge. Depending on where you live and drive such schemes may not affect you but it's something to consider if you're looking to make your next used car an oil-burner.

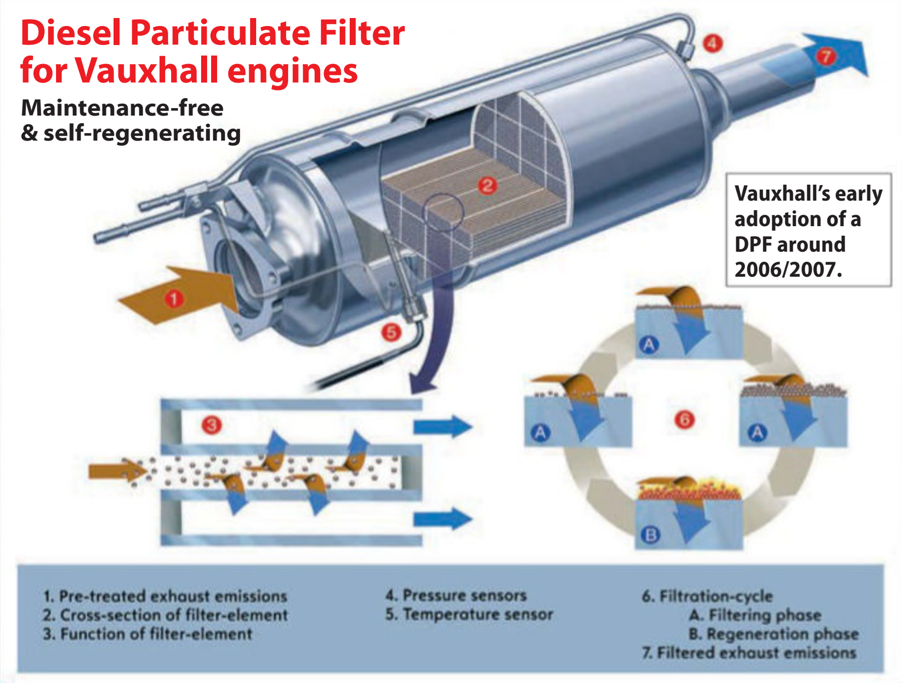
Reducing Emissions

As discussed above, ever-increasing levels of regulation has meant that carmakers have to employ sophisticated systems to limit the amount of pollutants emitted from the exhaust. Those systems have made a modern diesel engine more complex than ever, but there's one component that plays a key part and it's one that is often the cause of most angst amongst those choosing to a buy a diesel vehicle. So let's begin there.

Diesel Particulate Filter (DPF)

In itself it's a simple enough device, mounted in the exhaust system like a catalytic converter and used to trap the particulates, i.e. soot produced during the combustion process, and that would otherwise end up in the atmosphere. There's plenty of evidence around how harmful these particulates are to health, so anything that can be done to limit the problem has to be good news. The DPF has been fitted to cars for more than twenty years, with PSA Peugeot Citroën the first to introduce them back in 2000, and after gaining in popularity in the years that followed they essentially became compulsory with the introduction of the Euro 5 emissions regulations for new cars first registered from January 2011.

Past issues of *CM* have covered the operation of DPFs in some detail, but it's worth a brief recap. The soot that is trapped will build up inside the filter and there needs to be a process to empty it, turning the soot into harmless ash. That process is known as 'regeneration' and it happens in a number of ways. The first is 'passive regeneration' whereby normal driving on faster roads will see the exhaust reach a high enough temperature to burn off the soot, thereby keeping it at the correct level within the DPF.


Diesel Particulate Filter for Vauxhall engines
Maintenance-free & self-regenerating
1
2
3
4
5
6
7
A
A
A
B
1. Pre-treated exhaust emissions
2. Cross-section of filter-element
3. Function of filter-element
4. Pressure sensors
5. Temperature sensor
6. Filtration-cycle
A. Filtering phase
B. Regeneration phase
7. Filtered exhaust emissions

Vauxhall's early adoption of a DPF around 2006/2007.

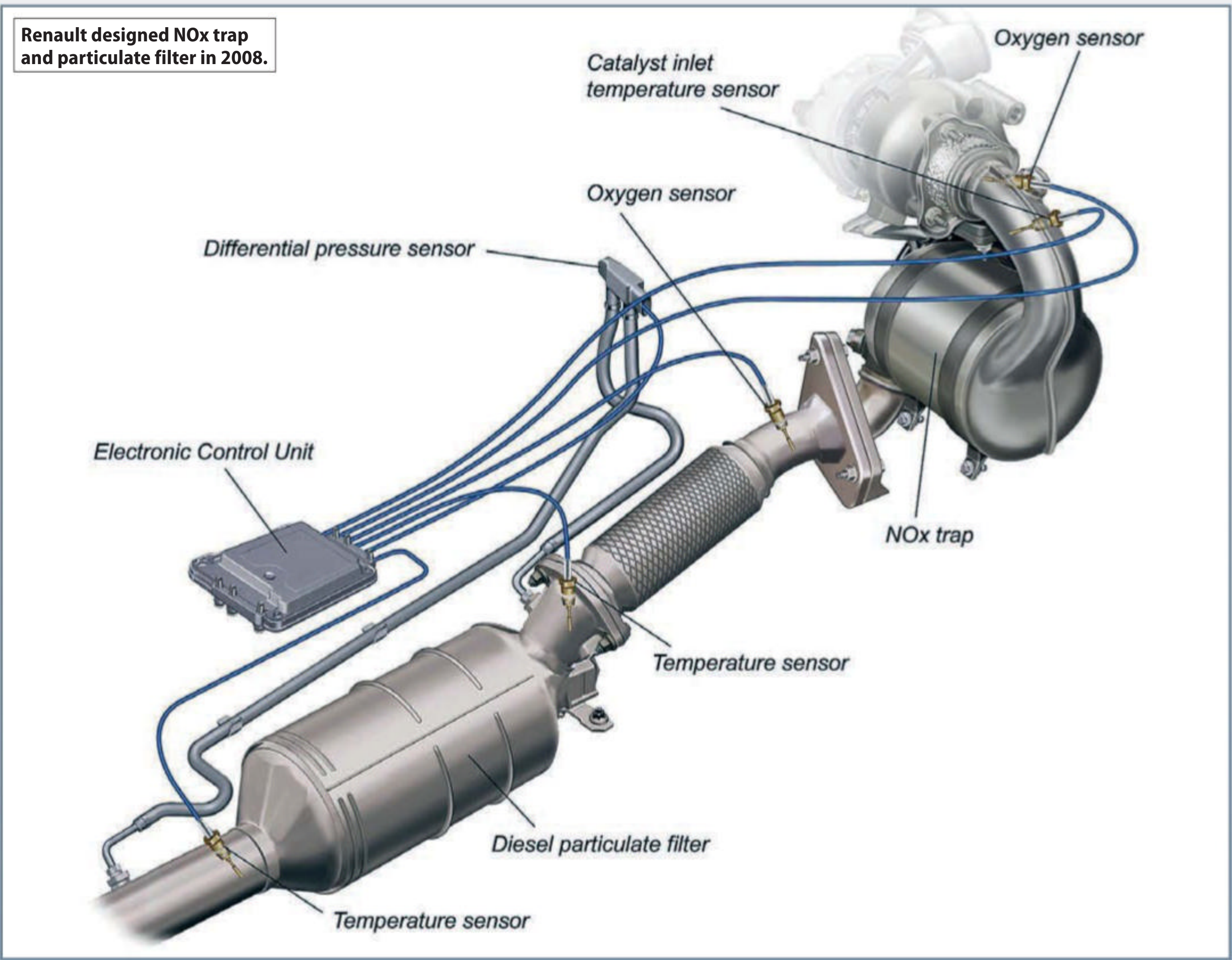
If that doesn't happen in normal usage then the engine ECU can initiate an 'active regeneration', a process that raises the temperature enough to deal with the soot. Ways of doing this include injecting extra fuel for hotter combustion or by using an additive like Eolys fluid that allows the soot to be burnt at a lower temperature. If this doesn't work and the DPF becomes blocked then the final approach is a 'forced regeneration' that is carried out using diagnostic equipment, although it's a pretty aggressive process and should really be seen as a last resort.

And to return to Eolys fluid for a moment, it was a system developed by PSA Peugeot Citroën (who referred to their DPF as a Filtre à Particules, or FAP, with its first use being on the Peugeot 607) and used mainly on their vehicles, although some other carmakers did employ the same set-up. Essentially, what Eolys does when added to the diesel fuel is coat the soot particles, and when these enter the DPF/FAP it's the coating that burns initially, raising the temperature and allowing the soot to burn off more easily. The amount of fluid added to the fuel is ECU-controlled and it will need periodic replenishment; you'll need to check the exact process for the car you're considering, and the fluid could be held in a tank or flexible pouch, but one thing to point out is that there may not be any kind of sensor fitted to indicate the remaining fluid level. Instead, this may be calculated by the ECU, taking into account factors like the mileage covered and the number of times the fuel filler flap has been opened, and this 'counter' needs to be reset when a refill is carried out. Depending on make and model it may be that a 'manual' procedure exists, otherwise a suitable diagnostic tool will be needed.

Anyhow, it's the whole business of regeneration that generally causes the most concern for drivers, but it needn't be the case. We'll deal with DPF problems in a moment, but assuming you undertake a mix of journey types that includes motorways or faster A-roads then the normal regeneration process should happen without any trouble and a filter can easily last for 150k miles before it might need replacement. However, it's true that issues can arise when cars are used only for short, stop-start trips where the system doesn't reach the temperature required to work properly, and where an active regeneration may not have time to be fully completed. In such cases the DPF can become blocked with further intervention required, so for that reason it's worth considering the sort of driving you have planned and whether a diesel car is going to be the most suitable choice. Unless you cover a high annual mileage or maximum fuel economy is a priority then a petrol or hybrid vehicle may well prove to be a better choice.

As for the problems mentioned earlier, the one that rears its head most frequently is a result of active regenerations that don't get completed, and where the extra fuel injected can find its way into the sump. Not only does this cause the engine oil level to rise, which is something to be avoided, but it also dilutes the oil which reduces its lubrication properties and promotes

Renault designed NOx trap and particulate filter in 2008.



premature wear of vital components. For that reason we would always advise regular checks of the oil level, and changing the oil and filter more often than advised by the manufacturer. The extended service intervals that are common today raise the risk of such issues, so sooner rather than later is the best course of action – at the same time ensuring the correct oil is used. If your car is fitted with a DPF then it must use what's known as Low SAPS oil (it stands for Sulphated Ash, Phosphorous and Sulphur); don't be tempted to use anything else as a substitute as you'll be raising the potential for costly problems in the future.

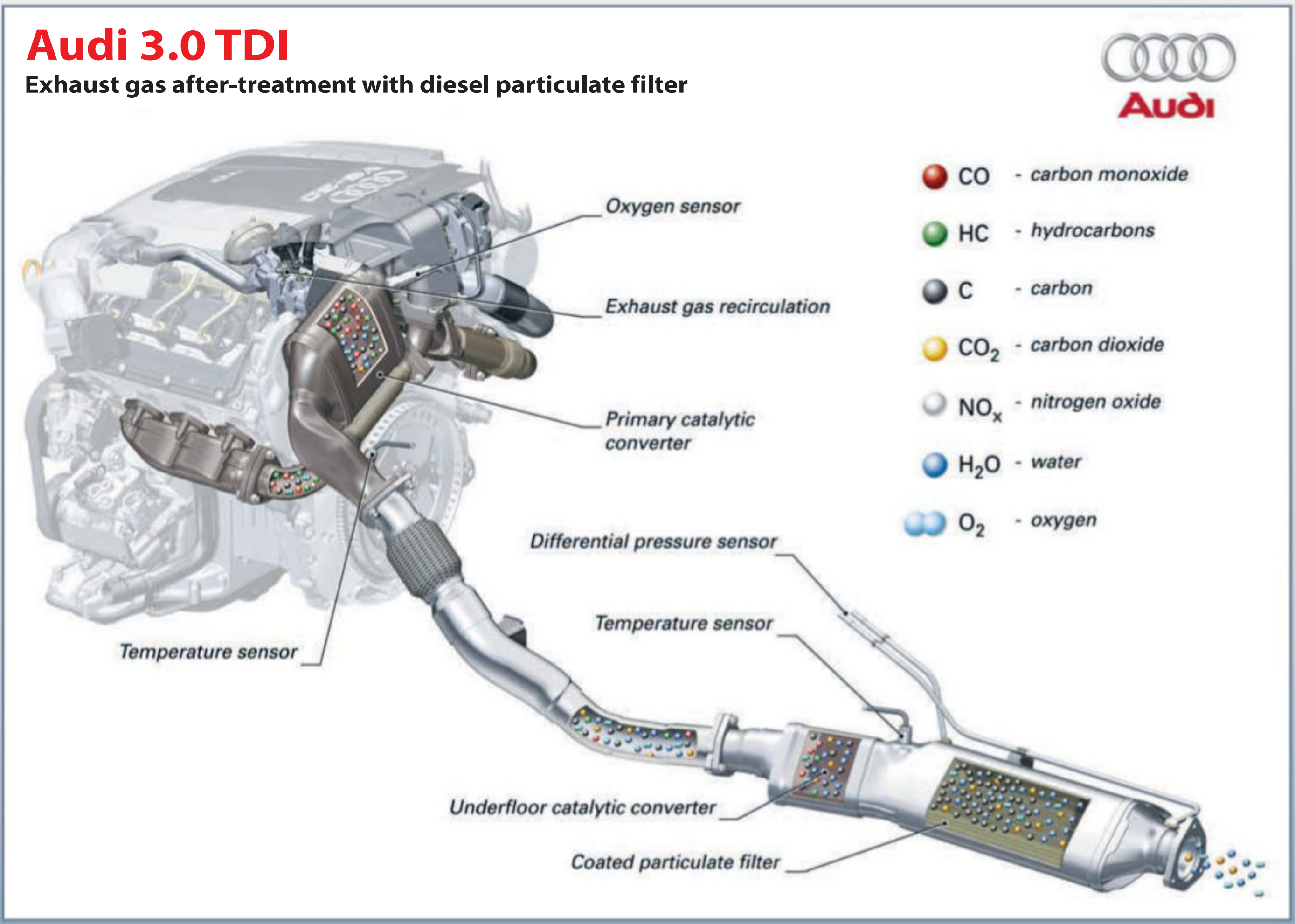
DPF Cleaning

If the filter becomes clogged and the normal methods of regeneration fail to solve the problem then it's worth considering getting it cleaned before you resort to the cost of replacement. This can be done with the DPF in-situ whereby a chemical cleaning agent is introduced to the system, but if that doesn't work then removal will be required along with the attention of a specialist. A number of them offer this service and they will normally check the inside of the filter with an endoscope before employing a process to remove accumulated soot and ash. As for cost, budget upwards of £100 to have a DPF cleaned (needless to say, it's important to establish what caused the blockage in the first place, whether it be a result of journey type or driving style, or a fault elsewhere). Anyhow, if all this seems a bit drastic then you might want to consider something that can keep a filter healthy…

Additives

On the basis that prevention is better than cure, engine additives have been around for years and promise all manner of benefits, from improving combustion to keeping fuel and lubrication systems free of contaminants like carbon and sludge. The ones we're interested in here are those that have the potential to keep the DPF in good health and working as effectively as possible, and there are a number on the market that say they can do just that. Well-known brands such **as JML,** LIQUI MOLY, Launch UK and Cataclean all have suitable products that they say can keep the DPF cleaner and less prone to blockages, and/or aid the regeneration process by helping the soot to burn at a lower temperature. JML's Diesel DPF ReGen Plus is one of the latter and a 250ml bottle needs adding to fifty litres of fuel. However, there are a few things to note when considering the

DIESEL
DPF
CLEANING SPRAY
Fast and effective cleaning of DPF
No dismantling of DPF
Extend service life
For professional motor mechanic
Cleans soot, carbon, deposits
JLM


Audi 3.0 TDI
Exhaust gas after-treatment with diesel particulate filter
Audi
Oxygen sensor
Exhaust gas recirculation
Primary catalytic converter
Differential pressure sensor
Temperature sensor
Temperature sensor
Underfloor catalytic converter
Coated particulate filter
CO - carbon monoxide
HC - hydrocarbons
C - carbon
CO2 - carbon dioxide
NOx - nitrogen oxide
H2O - water
O2 - oxygen

use of additives, the first being that they should be viewed very much as a preventative measure; it's no good waiting until you have a DPF problem such as a blockage as by then it's likely that more major attention will be needed. Unsurprisingly, we also recommend only buying a reputable brand as cheap products from an unknown source have the potential to cause expensive damage, and all additives should only be used as directed. Never be tempted to add more than the manufacturer states as over-filling can lead to problems, such as overheating of the DPF. Ultimately, opinions are divided amongst motorists as to whether additives form a useful part of a maintenance regime or are a waste of money, and while only you can decide we do think they are something worth considering if you want to keep your engine in tip-top condition.

PATENTED
CATACLEAN
DIESEL
SAVES FUEL
REDUCES EMISSIONS
HELPS PASS YOUR MOT
8 IN 1
THE COMPLETE FUEL & EXHAUST SYSTEM CLEANER
500ml

Selective Catalytic Reduction (SCR)

The DPF is just one part of the features that keep a modern diesel car as clean as possible, while another is the system we look at here. This one is all about enabling a major reduction in NOx emissions and as you might expect it's a pretty sophisticated arrangement that adds yet another component to the car's exhaust system, in this case a specific SCR catalyst that accompanies the standard catalytic converter and the DPF. Its job is to convert those harmful NOx emissions into nitrogen and water, and it does so with the use of something you'll either have used or seen for sale – AdBlue. That's the popular brand name for what's officially known as Diesel Exhaust Fluid (DEF), a substance made of water and urea (the latter turns into ammonia, which is what treats the NOx) that is injected into the exhaust system and SCR catalyst.

Needless to say ensuring just the right amount of DEF is added and at exactly the right time involves a fairly complex ECU-controlled system that includes components such as a tank to hold the fluid, a dosing module and pump, and an injector. There are also various sensors to monitor the whole operation along with a way of heating the fluid so the SCR remains operational even at very low temperatures. The number of miles you can cover before the fluid needs replenishing varies between makes and models, and while you can usually refill the tank yourself, some manufacturers recommend that it's done by a dealer.

All manner of retailers sell the fluid, from motor factors and garage forecourts to supermarkets, and while prices vary you can expect to pay around ten pounds for five litres. Naturally, we recommend buying from a reputable source and bear in mind that it does have a shelf life so leaving a half-used container lying around in the garage/shed is best avoided. And you can't avoid any warnings the car gives about the need to top-up the tank – regulations demand that the car won't start if the tank is empty or the SCR system has a fault that prevents it working correctly. The latter could be caused by sensor or wiring issues, while a faulty injector can result in too little DEF being used, leading to incomplete NOx treatment, or too much resulting in a build-up of urea crystals or the SCR catalyst becoming saturated with fluid.

Diesel
Diesel
AdBlue®/DEF
AdBlue®/DEF

With Euro 6 emissions came AdBlue as a further means of cleaning diesel exhaust fumes.

Further things to consider

It's possible that you're thinking about whether to stick with petrol power or plump for a diesel, in which case there's a few things worth considering. The first is the sort of usage you have planned, and if you cover a high mileage every year then an oil burner should almost certainly be on your shopping list. Yes, you'll pay a little more for the fuel at the pumps – at the time of writing the difference was around five pence per litre – but this should be more than offset by the superior economy. Another factor in the decision is the type of car you're after, and if you want something like a large SUV then diesel will be the way to go as petrol models, where available, are going to be notably more thirsty. And it's a similar case when it comes to towing – if that's a regular part of your motoring then filling up from the black pump is likely to make most sense.

In terms of other running costs it may be that you'll spend a little more on insurance and servicing but the differences aren't often all that great, and again the improved economy will help to offset some of this. It's worth spending some time doing the maths to work out the longer-term costs and savings before you make a final decision. And if outright performance matters to you, then you're unlikely to be disappointed with what's on offer; plenty of models offer the sort of punchy acceleration that was once the preserve of more sporting cars. Refinement isn't an issue, either, and while you can't necessarily expect the hush of a petrol or hybrid powertrain, the days of tiresome diesel clatter are long gone.

Which brings us to another important factor for many motorists, which is emissions. Diesel cars have long been considered as 'dirty' and while older models were certainly no paragons of exhaust cleanliness, cars that meet the latest Euro 6 standards are vastly improved in this regard. In any case, you'll need one of these if you plan on driving in low emission or clean air zones, otherwise you'll need to pay a charge or avoid such zones altogether in some cases. There's a huge amount of debate around the emissions of diesels, even the latest and cleanest variety, so it would be understandable if you wanted to consider this further before taking the plunge.

Maintenance

Here at *CM* we always champion proper maintenance – it's what we're all about, after all – and it applies whatever the type of engine you've chosen. As cars have become more complex it's more important than ever that comprehensive servicing is carried out on schedule, and that's certainly the case with a modern diesel engine. The complexity of emissions reduction equipment, and the need to have it working perfectly if more major problems are to be avoided, means you mustn't scrimp on maintenance.

You might choose to use a main dealer, local garage or marque specialist, but it's perfectly possible to carry out your own servicing on a modern diesel and we cover various makes and models on a regular basis in *Service Bay*. They can cover high mileages if looked after properly, and we certainly advocate servicing them more regularly than the official intervals – long-life service intervals may be convenient, and seem to save money compared to annual checks, but it can end up being a false economy.

So if you've decided to tackle your own servicing, the most important thing is to only use top-quality fluids and filters. Stick to OEM quality only and don't be tempted by cheap products found on the internet. Oil must be of the correct low-SAPS type which is crucial for the correct operation of the DPF, and don't forget the replacement of the fuel filter. Stick to the carmaker's scheduled interval at the very least, and bear in mind that ignoring this job risks problems with fuel injectors or high-pressure fuel pumps, both of which can be costly to rectify. We can't impress the importance of oil quality enough, particularly as failed attempts at DPF regeneration can lead to dilution with fuel which is never going to be good news for the lubrication of vital components. And for the same reason we recommend that regular checks of the oil level should be part of your maintenance regime. Equally important is ensuring that glow plugs are operating correctly as faults here can affect DPF regeneration, so if you suspect problems have them investigated and rectified as soon as possible. And the same applies to any issues with diesel injector seals, the failure of which can lead to poor performance, a reduction in economy and an increase in emissions, and carbon build up around the injector.

As for the fuel itself, using a good brand can help reduce the risk of problems, and while opinions are divided about the merits of supermarket fuel the peace of mind may be worth the extra few pence a litre. And you might also want to consider using a fuel additive, something we covered earlier on.

One final thing to mention here is the importance of emissions equipment working exactly as it should, and for that reason you should never be tempted to ignore warning lights. When it comes to the DPF it may not be an indication of a major and expensive fault, but instead simply advising that a longer, higher speed run is required to allow proper regeneration to take place. And whilst we've already mentioned this, it's worth re-iterating the need to heed warning lights that relate to Selective Catalytic Reduction equipment; it may simply indicate the need to replenish the AdBlue, which is something that can't be ignored.

Values

One other thing that we've not yet addressed is the issue of values. As diesel cars have fallen out of favour over the last few years you'd expect that to have an effect on the values of used models, and it has (although it's worth bearing in mind that values for petrol models have also fallen, but not by as much). According to the *Auto Trader* Retail Price Index the figures for October 2024 show that the average price for a used diesel car was down 7.1% to £14,066 (for comparison, the equivalent figures for petrol are 6.4% and £14,699). That's quite a way from the average price of £17,876 recorded in January 2022, and as values declined from that point there was a notably steep drop from around July 2023.

Sales and values for diesels haven't collapsed as some commentators predicted, but the downward trend will only continue, although where figures eventually end up is hard to predict. The market is still quite volatile, and the picture will continue to change as the 2030 ban on cars powered solely by internal combustion engines draws closer. What is clear is that developments such as London's Ultra Low Emissions Zone and its expansion in August 2023 affected the demand for, and prices of, diesel cars. That's especially true for non-compliant models where the owners faced the daily charge, although compliant ones fared better as you'd expect and were certainly easier for dealers to shift.

The upshot of all this is that a used diesel car is potentially going to represent a more affordable purchase compared to an equivalent petrol-powered rival, and if a diesel makes sense for your motoring needs then that's good news. That's not going to change in the short term to medium term, but how the market will react as we get closer to 2030 is a whole lot harder to say.

LIQUI MOLY
10W-40
Synthese-Technologie
DIESEL LEICHTLAUF
5L
Made in Germany

Changing oil and filter before recommended schedules will help the engine in the long-run – keeping the engine clean internally will keep emissions output down.

ALFA ROMEO GIULIA – 2016-on

Prices from £9000

▶ The BMW 3-Series that appears in our list is a brilliant car, but if you fancy something a bit different we'd definitely encourage you to take a closer look at the Italian rival. Launched in 2016, the most tempting model featured an impressively powerful twin-turbocharged V6 engine, but while we're focused on the rather more modest diesel version we think there's still plenty to like.

This saloon is certainly stylish, both inside and out, and it comes complete with all of the safety kit you'll need along with a roomy cabin and boot. The latter offers a useful 480 litres of space. The Alfa is good to drive too, and while the handling can't quite match the hugely-competent BMW there's still fun to be had when you're in the mood, plus there's the DNA switch that allows you to alter various powertrain settings. Quick steering boosted the feeling of agility too.

Five trims were available at launch (although some were for petrol models only) and each boasted plenty of kit, the spec sheet getting increasingly lengthy as you went up the range. Bigger wheels, electrically-adjustable leather seats and improved infotainment were all available while a minor update in 2017 added more options including Apple CarPlay and Android Auto connectivity. Suffice to say you won't feel short-changed when it comes to toys to play with.

But we've not talked about the engine yet which in this case is an all-aluminium 2.2-litre unit with a variable-geometry turbocharger and 2000 bar injection system. At launch there was a choice of 148bhp or 178bhp versions which combined decent economy with punchy performance – 0-62mph took 8.2 and 7.1 seconds respectively – and an upgrade in 2017 boosted outputs a little. A slick-shifting 8-speed automatic was the only transmission on offer.

Servicing was every 12k miles/annually and there's a cambelt to change at 60k miles; combine the two jobs and a specialist is likely to charge £900-1000. With the earliest cars not all that far short of a decade old it's advisable to check the service history is still spot-on, and on a similar subject it's important to ensure the engine's not over-filled with oil. When the Giulia appeared in an *Electronic Diagnostics* feature in the January 2025 issue of *CM* our friends at Turin Motors in Leeds advised that it can lead to turbo, injector and DPF failure (they also pointed out that early cars had a conventional dipstick while 2019 models onwards used a dashboard display). Be wary if you suspect issues in any of these areas as repairs can get expensive.

Another area to check is the electrics, problems with which can be traced to the battery. This may well be the cause if a car is suffering from seemingly random warning lights or failures, although software updates might also be needed to banish annoying faults. There's not a great deal else to worry about, though, and the Giulia offers an enjoyable alternative to the usual premium marques.

And if you can stretch the budget we'd suggest aiming for as late a model as you can, as that way you'll benefit from the numerous improvements introduced over the years. For example, the infotainment system got better and 2018 saw a 5-year warranty made standard.

BMW 320d – 2012 to 2019

Prices from £3000

▶ Compact executive cars don't come much better than the BMW 3-Series, and while rivals such as the Mercedes-Benz C-Class, Audi A4 and Jaguar XE run it close they can't manage quite the same all-round ability. So it's the product from Munich that's our pick here, and the one we've chosen is the F30 generation that arrived in 2012. The sixth generation of 3-Series, it was available in a choice of body styles – saloon, Touring estate and fastback GT.

Which you go for is a matter of personal preference, but before we go any further it's worth mentioning that we've specifically chosen the updated model that was introduced for the 2015 model year. The reason for that is the B47 diesel engine, this unit replacing the N47 unit that didn't have a great reputation, especially when it came to timing chain-related hassles. The newer motor avoids all that and can cover a big mileage as long as it's properly maintained, but we'd still keep an eye out for any issues relating to the DPF and turbocharger. As far as we can tell there was also a recall related to the EGR system, so check whether any work was completed.

Find one that's been well looked after, though, and you're in for a real treat. Like the 3-Series that went before it this one is brilliant to drive, and offers a terrific blend of ride and handling. Few of its competitors get close to being such a complete package in this respect, so if driving entertainment matters to you this is a car that's easy to recommend. All of the controls feel slick and well-matched, and that's combined with plenty of straight-line punch thanks to 187bhp and 400Nm of torque. Equipped with an 8-speed automatic gearbox it'll get from 0-62mph in 7.2 seconds, and that pace is combined with a claimed 67.3mpg and 111g/km CO_2 emissions. It could be had with four-wheel-drive too.

Already a highlight, the cabin of the updated model benefitted from a few tweaks to the material finishes, navigation was standard and the iDrive system was also improved. Comfortable and usefully spacious inside, a 480-litre boot adds practicality too (the Touring stretched this to 495-1500 litres). Amongst the various trim levels, M Sport proved tempting thanks to sportier looks, and while all versions got retuned suspension this version also got a stiffer set-up that was lowered by 10mm. It does make the driving experience feel a bit sharper but that comes at the expense of ride comfort, so you might want to consider one of the other trims and avoid larger wheel options.

As for ownership, there are plenty of BMW specialists out there that can help keep maintenance costs in check, and with the promise of decent economy this classy executive car shouldn't break the bank. There are plenty to choose from in the classifieds too, so you can afford to be fussy when it comes to finding one that's been properly looked after and in the specification that suits you best.

FORD FOCUS – 2014 to 2018

Prices from £2500

▶ If you prefer your diesel-powered family car to have a Ford badge rather than a VW one then this major update of the third-generation car should be just the ticket. Like the Golf it could be had as a hatch or estate and there were some significant improvements over the previous version, from sharper looks and updated engines to better infotainment. A few different TDCi motors were available but the one we're interested in is the 1.5-litre; essentially a down-sized version of the 1.6 used previously, it benefitted from a number of revisions aimed at making it cleaner and more efficient. Euro 6-compliant, buyers could choose from a variety of power outputs with the 118bhp variant promising 0-62mph in 10.5 seconds and 74mpg economy. You're not likely to achieve that last figure but 55-60mpg should be possible in everyday use, so you shouldn't need to visit the pumps too often. We'd opt for the six-speed manual gearbox, though, as the optional Powershift automatic isn't the last word in responsiveness, and it has a reputation for being troublesome too.

The engine can sound a touch coarse at higher revs but there's enough torque to make good progress at lower crank speeds, and Ford had improved refinement on this latest model thanks to thicker glass and more sound insulation. It's a decent long-distance companion, then, and you'll certainly appreciate the comfortable cabin and healthy list of standard equipment. Apart from entry-level models most trim levels got Ford's Sync 3 infotainment system with an 8in colour screen, and while it's not perfect it's preferable to the previous version's button-heavy layout. And speaking of trims there were a number to choose from, including the plush Titanium X and the sportier ST-Line that featured a bodykit and bigger alloys. Where the Focus lost out to rivals is luggage space, the hatchback's boot being notably less capacious than the Golf so if you need to carry a lot of stuff go for the estate instead.

But leaving matters of practicality aside what the Focus did offer was a fun driving experience, Ford having fettled various aspects of the chassis to keep this revised model at the top of the class. It certainly feels responsive with the re-tuned steering providing feedback and accuracy that was lacking in most rivals, and there's an overall sense of polish that makes it genuinely enjoyable even when you're just ambling about.

A search through the classifieds reveals plenty of examples to choose from, so there'll be something to suit your budget, and there's further good news in that there's not much in the way of complaints about this particular diesel engine. We'd certainly make sure that the car you're considering isn't exhibiting any signs of DPF regeneration issues, and with a lengthy cambelt renewal interval – 10 years or 112,500 miles – a record of this being done sooner adds peace of mind. And given that even the newest example dates back six years or so watch that regular servicing hasn't begun to be missed.

HONDA CIVIC – 2012 to 2017

Prices from £2000

▶ Both the current and previous generation Civic boast sharp styling, but the version we have here isn't exactly lacking in the looks department. It built on the more radical shape that had been introduced back in 2006, and even today it stands out from similar-aged rivals in the family hatchback sector. Built at the now-defunct Swindon plant and available in hatchback and good-looking Tourer estate versions it proved very popular with buyers wanting a reliable and well-engineered car.

It certainly gave the likes of the Ford Focus, Vauxhall Astra and VW Golf a run for their money, and while it mightn't have been a class-leader in any particular respect, it was a well-rounded package. It's certainly one we're happy to recommend today, not least because of the way it looks inside and out and the practicality on offer – the hatchback provided a useful 467 litres of boot space, and the 'Magic Seats' in the rear were a real boon when it came to carrying tall items.

So, to the diesel engine and when the car arrived in 2012 it was offered with a refined 148bhp 2.2-litre i-DTEC unit allied to a slick manual gearbox. With claimed economy in the mid-60s and 0-62mph in around 8.5 seconds it's easy to see why it appealed to those wanting to keep fuel bills low.

A facelift in 2015 saw some changes, though, and this engine was replaced by a cleaner and even more frugal 1.6 i-DTEC with 118bhp; outright performance was more modest but it's likely that most owners would have preferred the fuel-sipping economy anyway.

Neither engine has a reputation for trouble and with 12-month/12.5k-mile servicing and no cambelt to worry about, maintenance was as straightforward as you could want. The only things to keep an eye out for are DMF or DPF issues, but an example that's been maintained properly should still make for a hassle-free ownership proposition.

With the mechanical stuff out the way we can look at other reasons why this particular Civic is worth considering, and one of them is the comfortable and well-equipped cabin. The dashboard layout is somewhat different, so whether that suits is a matter of personal taste, but it all works well enough even if infotainment and navigation systems feel dated now. It's not what you'd call plush and some reviewers carped about material quality, though it should last well. SE spec had plenty of kit, yet bagging an EX will get more toys and leather trim.

Something else we like is the way it rides and handles, the combination of MacPherson struts at the front and a torsion beam axle aft ensuring it feels capable and secure. Not exciting, mind, and a Ford Focus provides much greater precision and agility but if that doesn't matter to you then the way the Civic goes about its business should prove entirely agreeable.

MAZDA CX-5 – 2012 to 2016

Prices from £3000

▶ Go back a decade or so and the choice of SUVs was really growing, so it's no surprise that Mazda wanted to get a slice of the action for themselves and this smartly-styled model was the answer. UK sales began in May 2012 and thanks to the KODO Soul of Motion design language it was definitely one of the more eye-catching cars of its type, and that would attract plenty of buyers.

There's not entirely good news when it comes to the diesel, though – more on that later – so while you might be wondering why it makes our list let's take a look at the good stuff first. One of the positive points was ride and handling that put it towards the top of the family SUV class, so if you wanted to enjoy your time behind the wheel the CX-5 was an excellent choice. It was also spacious and practical inside, with excellent ergonomics and a boot that offered 503 to 1620 litres of carrying capacity. Build and material quality was pretty impressive too, although the passing of time and miles did allow a few rattles and electrical niggles to surface. But those annoyances aside the cabin was a nice place to be.

Turning to the engine, and in terms of specification, it was a 2.2-litre unit that Mazda claimed had the lowest compression ratio for a diesel in the world. 148bhp and 173bhp versions were offered with claimed economy around 60mpg and 50mpg respectively, and an i-stop Stop/Start system boosted efficiency further. Transmissions were 6-speed manual or automatic, and the lower powered unit could be with front- rather than four-wheel-drive. There was no cambelt to replace and servicing was every 12 months/12k miles. So far, so straightforward.

But it's when you start looking at the reliability record that things don't appear so rosy, and specialists we've spoken to in the past have warned of various problems. For one thing, regular oil and filter changes were crucial as DPF regeneration issues led to oil dilution, but there was more bad news to come including early versions that had faulty camshaft hardening, allowing metal particles to enter the lubrication system with predictably disastrous consequences for the engine and major components. Also noted was the potential for turbo and head gasket failure, as well as poor running caused by excessive carbon build-up; that meant spending a fair few hundred pounds to have the EGR and inlet manifold stripped and cleaned. Failed injectors and injector seals could be problematic too. Warning lights and lack of power pointed to a failed pressure sensor on the exhaust manifold, and the sump oil strainer gets blocked with carbon.

It's not a very pretty picture, and something of a surprise given Mazda's usually sound engineering. Should it put you off buying one, though? Perhaps, but if you do decide to take the plunge spend plenty of time establishing the engine's health.

MINI – 2014 to 2024

Prices from £2500

▶ We've reached the smallest and sportiest car in our round-up, and while some enthusiasts might be aghast at the thought of saddling the fun-to-drive MINI with a diesel engine it made plenty of sense. Not least from an efficiency point of view. Fitted to the One D and Cooper D and making 94bhp and 114bhp respectively, the 1.5-litre 3-cylinder unit claimed economy of 70mpg or more and while you might not achieve quite that much it still made for frugal motoring.

Performance still felt nippy too, with the more powerful version giving the 3-door hatch a 0-62mph time of around 9 seconds. Upgrade to the 2.0-litre four-pot in the Cooper SD and the 168bhp cut the same sprint to 7.2 seconds, so there's certainly enough performance to have fun. Depending on model there were 6-speed manual or 6-speed automatic gearboxes, the latter swapped for a 7-speed DCT later on.

This third generation model was available in 3- and 5-door hatchback, Clubman estate and convertible forms so there's something for every taste, and all of them provide the same entertaining driving experience that MINI fans expect. The company like to go on about 'go kart' handling but there's no doubt that fun is very much on the menu, the quick steering and responsive chassis ready to put a smile on your face. Yes, the petrol engines ultimately feel more appropriate and will be the enthusiasts' choice, but the diesel economy isn't to be sniffed at. And there's plenty more to enjoy apart from what's under the bonnet.

For one thing there's the funky cabin styling featuring a large circular screen in the middle of the dash, and with good build and material quality it's a great place to spend time. Unless you need more space, of course – the rear seats are pretty cramped, and 211 litres of boot space in the hatchback is nothing to shout about. Still, such things probably won't matter when you're enjoying the driving experience.

Being a MINI there were lots of ways to personalise the car, and along with numerous option choices no two are likely to be the same. It's going to be a case of finding the combination that suits you, and it's worth spending time establishing the precise specification of the car you're considering. With lots of these cars for sale, the perfect one for you is out there somewhere!

Given that production lasted ten years it's no surprise to discover that plenty of changes and improvements were made in that time, and there's simply not the space here to list them all. Many of the updates delivered better equipment levels, there was a MINI SEVEN special edition in 2016 and 2018 saw revised trim levels and the introduction of 'Union Jack' tail lights which weren't to all tastes.

Not long after that the diesel engines would be dropped from the range entirely as sales of oil-burners continued to decline. Overall reliability was sound, though, so just make sure that regular maintenance hadn't slipped as the years went by.

CLUBMAN
OE65 BWK

PEUGEOT 508 – 2011 to 2018

Prices from £2000

▶ Large family cars from mainstream manufacturers have rather fallen out of favour – see the demise of the Ford Mondeo and Vauxhall Insignia – but if you're looking for something smart and spacious they can still hold plenty of appeal. The 508 is a case in point. Available in saloon and SW estate flavours, it was spacious, comfortable, well-equipped and nice to drive while a facelift in 2014 delivered useful improvements. In fact, that's the one we'd go for as it boasts sharper looks, LED lighting and more safety tech.

A good ride and composed handling make it a pleasant way to cover the miles, and when combined with lively and efficient diesel engines it makes for a strong package. Oil burners were always the way to go with these cars and there was a variety of frugal HDi units to choose from with capacities ranging from 1.6 to 2.2 litres. The latter got 197bhp for punchy performance and economy around 50mpg, but it was the 1.6 Blue HDi that sipped the least fuel with claimed economy of 74mpg. The 178bhp 2.0 was a good all-rounder in terms of performance and frugality, and could be had with a conventional automatic gearbox rather the somewhat clunky automated-manual EGC 'box.

One other version worth mentioning is the RXH which borrowed the diesel-electric HYbrid4 powertrain from the 3008. Able to potter around on electric power alone, it combined the all-weather security of four-wheel-drive with decent performance and efficiency. They're rare in the classifieds, though, so a bit of patience might be needed when it comes to tracking one down.

All 508s had a good level of standard kit with even base models getting everything you really need, but top-spec versions are positively lavish with the likes of Nappa leather and a head-up display. Whichever one you choose we'd spend a bit of time making sure that everything still works; electrical gremlins aren't uncommon, and infotainment systems can play up. As for the mechanical side of things overall reliability is pretty good.

Some owners have reported issues with the dual-mass flywheel and you'll want to make sure that the DPF is healthy. Depending on model, the 508 could go up to 2 years/20k miles between services (it was shorter for the 1.6 HDi) but as always our advice would be to halve that interval. Finding a car with an unbroken record of oil and filter changes will bring peace of mind.

As for buying one, we found a good number for sale so you shouldn't have any trouble finding the 508 to suit you. There are some high-milers out there but don't be put off if the service history is sound, and if you go for a late model you'll benefit from a raft of improvements that made this French family motor a pretty appealing prospect.

PZ64 PMF
508

RANGE ROVER EVOQUE – 2011 to 2019

Prices from £4700

▶ Arguably the most stylish car on our list, and a hugely popular one, the first generation Evoque we have here grew out of the LRX concept of 2008. Making it into production with relatively few changes it was a smash hit with buyers and could be had in three- or five-door form and with two- or four-wheel-drive. The latter was usefully capable off-road thanks to the Terrain Response System, although it's unlikely that many owners ventured into the muddy stuff. At launch the 2.2-litre turbodiesels came in 147bhp TD4 and 187bhp SD4 flavours and offered decent performance and economy, but we're concentrating on the 2.0-litre Ingenium engine that replaced them in 2015. Initially available in two power outputs (a more powerful version joined the range in 2017) it's this engine you'll need if you want your Evoque to be ULEZ-compliant.

There's plenty to like about the way this engine goes about its business, proving refined and flexible and with enough punch to make the style-focused SUV feel lively. Where it doesn't fare so well is a reputation for problems, and you don't have to spend long on the internet to find all manner of complaints about unreliability. Potential issues include DPF-related bothers, oil dilution and timing chain problems so you'll need to inspect the service history very carefully. We'd certainly avoid a car where there's gaps in the maintenance record, and early oil changes are highly recommended. Buying one with a good warranty is sensible too.

But in spite of all that it's an engine that suits the Evoque, and allied to a 9-speed automatic gearbox it makes for satisfyingly relaxed progress. Opting for the front-wheel-drive, manual gearbox eD4 delivers strong economy, although you'll struggle to achieve the claimed 65mpg. And when you consider the rest of the package it's easy to see why the smallest Rangie proved so popular. A facelift in 2014 had tweaked the looks and refreshed the trim levels and equipment, and a Convertible arrived a couple of years later but it struggled to find buyers and was quietly dropped after two years on sale.

Further revisions in 2017 improved the infotainment and the InControl Touch Pro system was definitely a step forward in terms of usability. It made the already smart and plush-feeling cabin even better, and it's a nice place to be with good space for people and luggage. There's 550 litres for the latter, and the five-door version provides a little more headroom in the rear if that matters to you. All models were well-equipped as standard but with a wide range of spec and option choices it pays to do your research to make sure you're getting the version that suits you best.

This first generation car was replaced in 2018, but there's still plenty of them to choose from and at tempting prices too. Make sure it's been looked after properly, and pay close attention to engine health, and this trendy SUV has a lot to offer.

VOLKSWAGEN GOLF – 2013 to 2020

Prices from £3500

▶ The TDI engine has been around for years now, and here we've chosen it installed in the family-friendly Golf. Specifically, the seventh generation that arrived in 2013 – plenty of buyers still prefer it to the more digitally-focused Mk8, and while it might not feel as high-tech it's still a very capable all-rounder. As for the engines, there's plenty of expertise when it comes to maintaining them and they generally prove reliable with regular maintenance. EGR and fuel pump issues are worth watching for, and with lengthy cambelt renewal intervals we'd look for a car that's had it done sooner. Check, too, whether the car you're interested in has been on the long-life servicing regime which allows 20k miles/2 years between services; we always think more regular attention is better.

There was a range of engines on offer starting with a 104bhp 1.6 TDI that wasn't particularly quick but did offer impressive frugality. The 113bhp version that arrived later felt a bit peppier. As did the 2.0-litre with 148bhp that combined decent punch with claimed economy of 60mpg, and being the EA288 unit there are no worries about the fallout from the 'dieselgate' debacle. For those wanting more pace, the GTD should fit the bill, with 181bhp and 280lb/ft of torque for 0-62mph in around 7.5 seconds. Available with 6-speed manual or 7-speed DSG gearboxes (as were other diesel models), it wasn't quite as exciting as the full-fat GTI petrol but it was a punchy performer nonetheless and the sportier cabin trim was appealing too.

Having picked the engine you prefer what else are you getting? Well, a simply brilliant family car that blends excellent quality inside and out with a composed driving experience, and it's one you could experience in hatchback or more practical estate form. Even the former offered 380 litres of luggage space so there's enough for most needs, and there's ample room for passengers so occupants won't feel cramped even on a long journey. And it's here where a Golf really excels, providing the sort of ride comfort and refinement that befits a more expensive car and makes covering big mileages a comfortable and relaxing affair. There was plenty of trim levels to choose from, but opting for an SE brings all the kit you need including cruise control and Android Auto/Apple CarPlay connectivity while SE Nav adds a few niceties including the obvious one.

It might not seem like the most exciting choice but a Golf will fit into your everyday life very nicely indeed, and it's a very easy car to recommend. Of course, the TDI engine appeared in a wealth of other models, including those from Audi and SEAT, but two that particularly catch our eye come from Skoda. The Fabia on sale from 2007 to 2015 is an affordable and capable supermini offering impressive efficiency in diesel form, but for more space our pick is the Octavia estate that appeared in 2013. As a frugal and affordable load-lugger it's very hard to beat.

VOLVO XC60/XC90 – 2017-on/2015-on

Prices from £12,500/£13,000

▶ Last year saw Volvo build its last diesel car, which makes this the perfect time to see whether a pair of used models are worthy of your cash. The first one we're considering is the XC60 that was launched in 2017, this second-gen model improving on the first with updated styling and a more premium feel. That's certainly true on the inside where you'll find plenty of space and the sort of comfort that means you can get out after a long journey feeling as fresh as when you started. Strong refinement helps here too, and the modern interior features a 9in infotainment screen that works pretty well, even if using it to adjust the climate control is a bit fiddly. Engine-wise, the 2.0-litre four-cylinder unit was good for 188bhp which meant 0-62mph in a competitive 8.3 seconds, while claimed economy was 55.4mpg. It's a reliable unit, and apart from the odd report of EGR issues there doesn't seem much to worry about here. And should you have fancied something with a bit more punch the alternative was the D5 Power Pulse unit that combined 232bhp with claimed 51.4mpg economy.

All versions were allied to an 8-speed automatic transmission and four-wheel-drive. Whichever one you choose you'll be getting a sharp-looking SUV that boasts all the practicality you could need for family duties, and it won't leave you wanting for kit. Even entry-level Momentum trim got leather seats, LED headlights and a powered tailgate and heading up the range saw the spec get even more lavish.

For those wanting even more space for people and luggage then we'd point you in the direction of the XC90, specifically the all-new model that arrived in 2015. It certainly looked more stylish than before, touches such as the 'Thor Hammer' running lights bringing it bang up to date, but it's inside where it really impresses. There is acres of space, and even with all seven seats in place you'll still get 451 litres of luggage capacity, a figure that grows to 1951 litres with the second and third row folded. The rearmost chairs are properly sized too, meaning that adults will be able to get comfortable.

And comfort is what the XC90 provided in spades, thanks to luxurious trim and all the kit you could need. It was very much a premium affair, and with all three rows getting side airbags it was a safe place to be too.

Refined, good to drive and a very relaxing way to cover big miles, it's a very appealing package. Those wanting an oil-burner got a 222bhp D5 unit (a four-cylinder despite the badge) which claimed 48.7mpg and could crack the 0-62mph sprint in 7.4 seconds. The 232bhp Power Pulse unit was added to the range a little later, but either unit provides ample performance and the potential for decent economy if you employ a light right foot. The optional air-suspension is worth having but we'd avoid cars fitted with the bigger wheel choices; they look great but we'd prefer the cossetting ride you get with smaller rims.

Hyundai Santa Fe STEERING WHEEL ALIGNMENT

Peter Rosenthal straightens the steering wheel of a Hyundai Santa Fe.

After tracking or alignment work it's not uncommon for garages to leave the steering wheel slightly off centre and this used Hyundai Santa Fe had a wonky steering wheel from the get-go that had never been sorted.

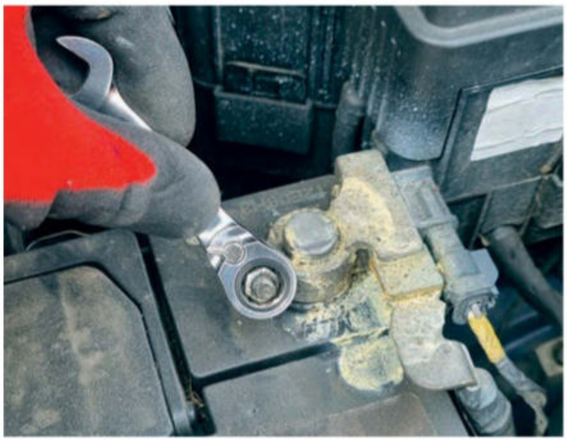
This procedure would be the same if you need to replace the airbag unit, swap out failed steering wheel buttons or to replace the entire steering wheel itself. The key safety point to note is that the vehicle's battery must be disconnected from the car for at least 30 minutes prior to starting work.

This is to allow time for the airbag capacitor to discharge fully – these are designed to hold a charge for a short period of time so that the airbag can still work even if the vehicle battery gets damaged in an accident.

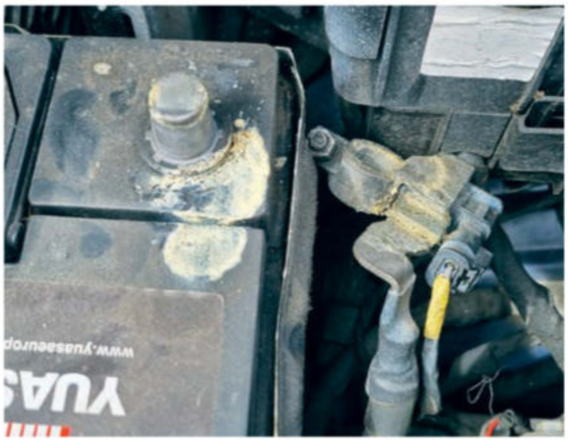
It's helpful to park the vehicle with the wheels aligned straight ahead before starting work and while some people take the car for a drive with the airbag still removed, this isn't advisable as it will cause the ECU to trigger an airbag warning light. Plus, you'll have no horn. So, for safety and to save having to use a code reader to reset the airbag light, it's best to repeat the whole procedure if the wheel alignment needs further tweaks. The hard part is getting the steering wheel loose, but once you've done that the job is a doddle and shouldn't take much more than half an hour.

EQUIPMENT REQUIRED

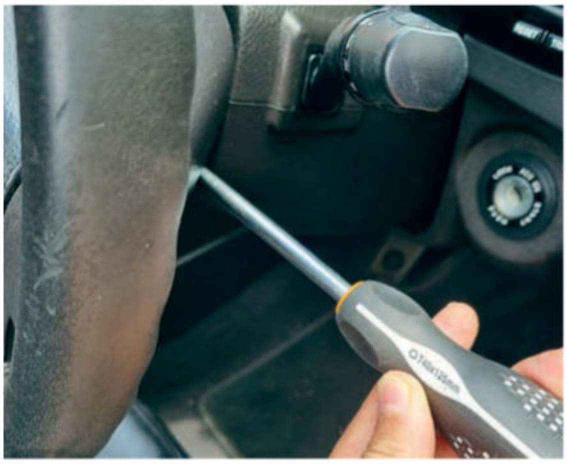
- 21mm socket and ½in ratchet driver
- ½in extension bar
- Torque wrench
- 10mm spanner (ratchet ideally)
- T40 Torx screwdriver (or T40 bit and 3/8in ratchet driver)



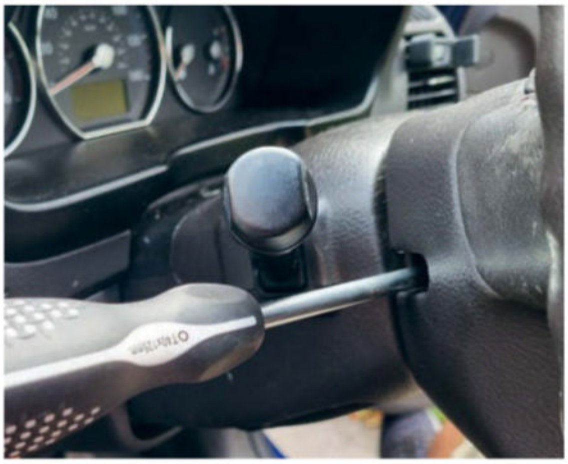
1 **With a 10mm spanner, remove the negative lead to the battery terminal.**



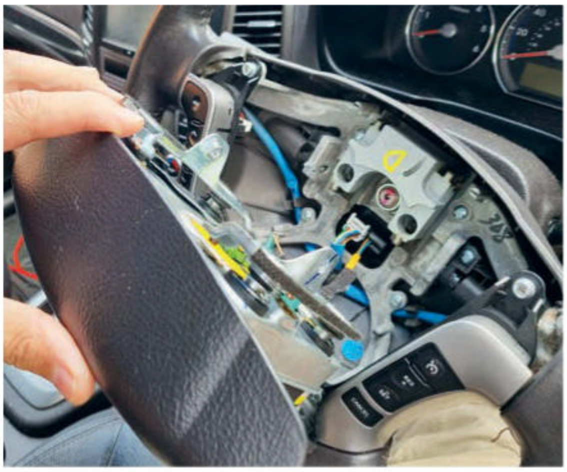
2 **Tuck the negative lead out of the way so it can't possibly touch the negative terminal. Loosely cable tie the lead to something if required.**



3 **Wait at least 30 minutes before you go near the vehicle and then remove the T40 Torx screw from behind the steering wheel.**

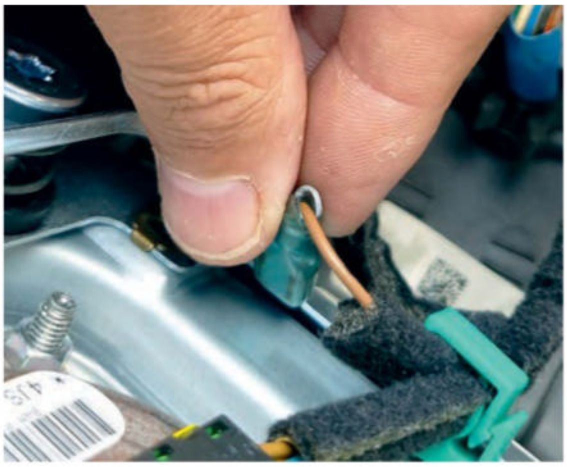


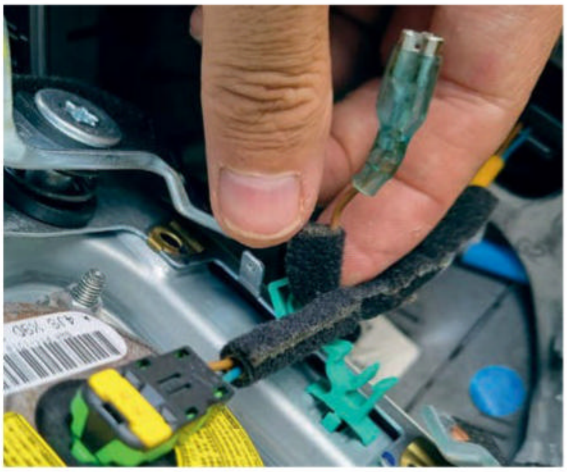
4 **Unscrew the second T40 Torx screw on the other side of the steering wheel. The airbag and horn assembly should now feel loose. If it doesn't try unscrewing the screws a little more.**



5 ◀ Carefully lift the airbag forwards taking care to note where all the wiring goes – a photo on your phone is wise. Don't let the airbag dangle or stretch its wires.

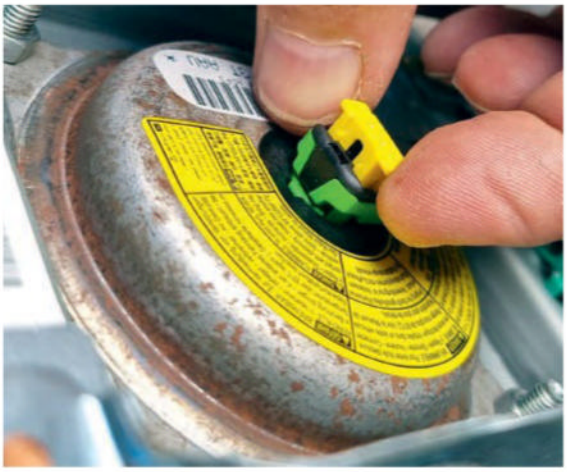
6 ▶ With the airbag supported with one hand, remove the spade terminal earth connector on the rear of the assembly.

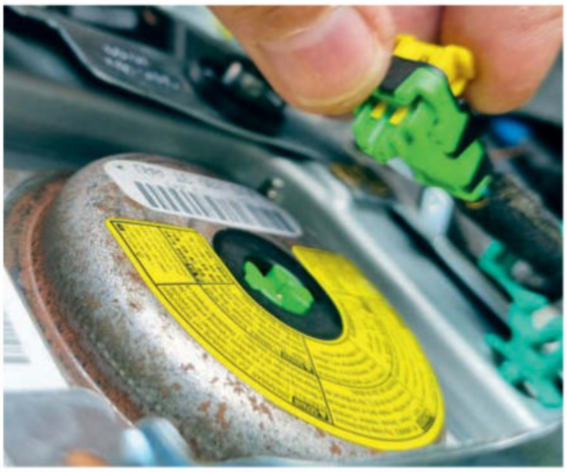




7 ◀ Unclip the green plastic loom support clip to release the earth wire loom.

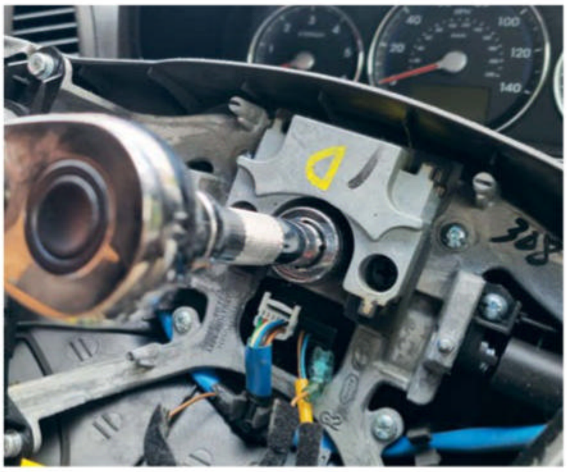
8 ▶ Yellow connectors or wiring usually denote airbag wiring (so never go near them until the 12V battery negative terminal has been removed and left for at least 30 minutes). Using the edge of your nails, or a small flat-blade screwdriver gently ease up the yellow plastic airbag connector clip.

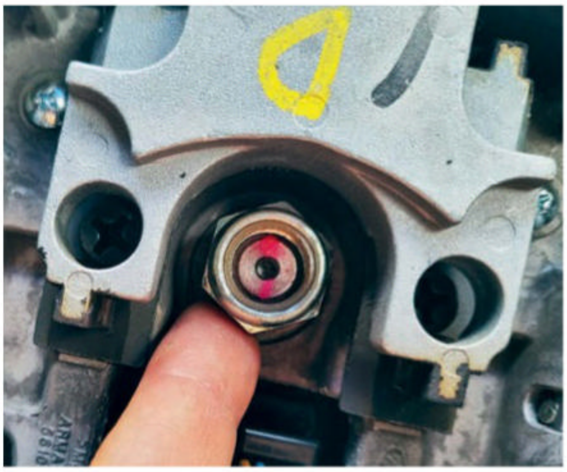




9 ◀ The green connector can now be lifted free from the rear of the airbag. It should come out easily, if it doesn't try pulling up the yellow retaining clip a little more.

10 ▶ Remove the whole airbag and horn and put to one side. Using a 21mm socket and an extension bar use a ½in ratchet driver to loosen the central steering wheel nut.

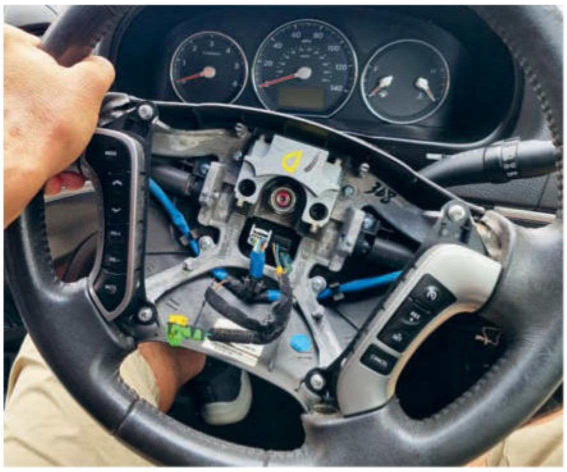




11 ◀ Do not fully remove the steering wheel nut, make sure it still has a couple of threads to go – this prevents you smacking yourself in the face when the steering wheel comes free!

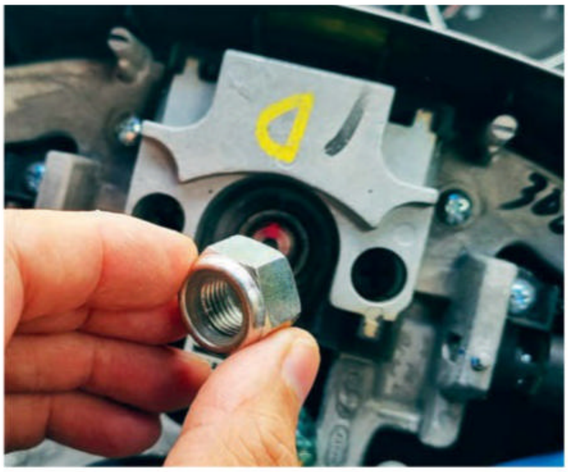
12 ▶ Try and pull the steering wheel free with two hands. It probably won't budge, so try whacking all around the rim with your fist. This will usually jolt it free.

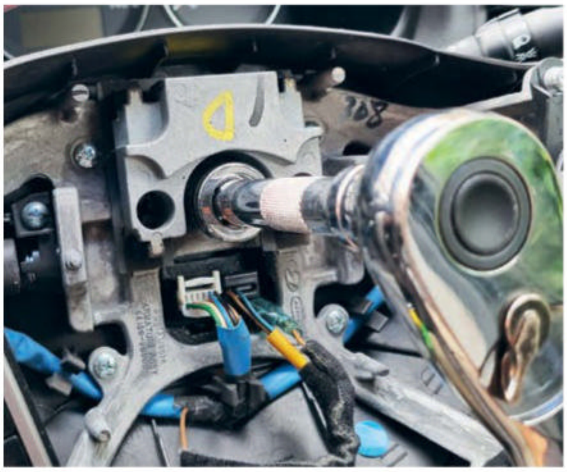
2011 Hyundai Santa Fe steering wheel alignment



13 ◀ Now try pulling the steering wheel sharply towards you with two hands. It should come free, but if not bash the rim again. It will eventually release.

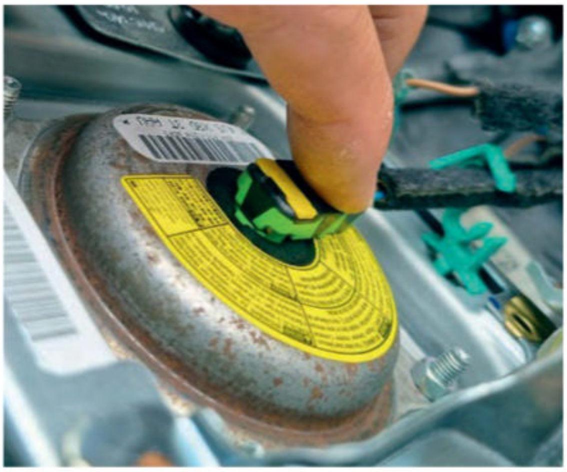
14 ▶ Once the wheel is loose on its splines remove the central nut, pull the steering wheel backwards and, making sure the front wheels are centred, replace it in a more central position on the splines.

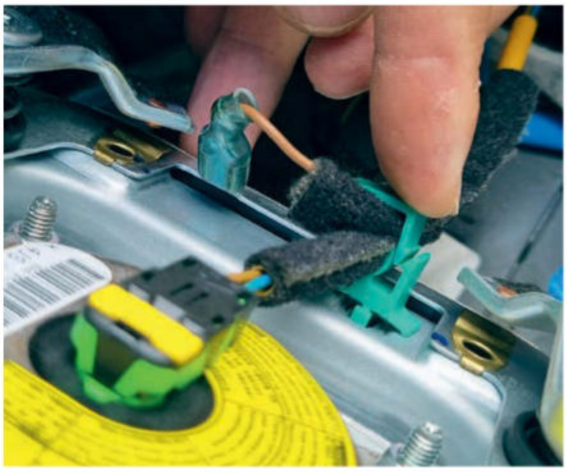




15 ◀ Refit the steering wheel's 21mm nut and tighten it up to 50Nm using a torque wrench.

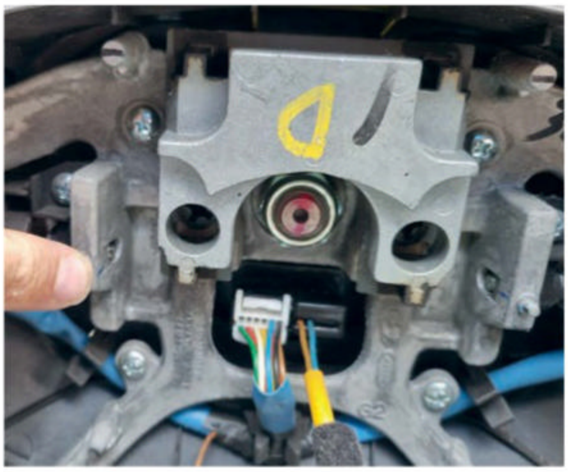
16 ▶ Refit the airbag assembly and push the green connector back in place. Secure it by pushing the yellow locking tab flush with the connector housing.

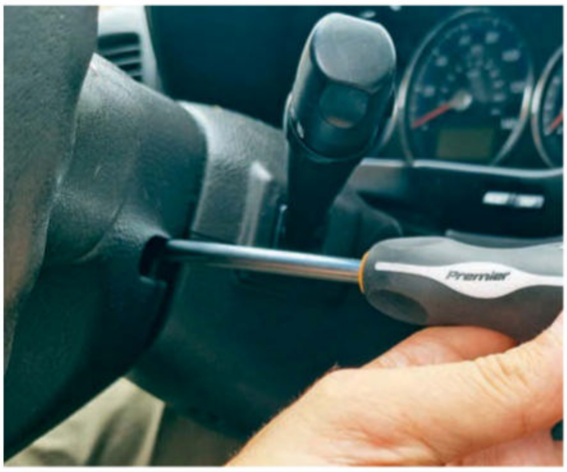




17 ◀ Reattach the spade terminal to the horn tab and then tuck the wiring loom back into the green cable clip and snap it closed.

18 ▶ Check that the airbag securing Torx screws are both pushed back flush with the metal housing, then push the airbag assembly back in place.





19 ◀ Refit the two T40 Torx airbag-securing screws on either side of the steering wheel and tighten them to 10Nm. Refit the negative terminal to the battery, tightening with a 10mm spanner.

20 ▶ Start the engine and check that there are no warning lights and that all the steering wheel buttons and horn still work. Then take the car for a drive and see if the steering wheel is straight. If it needs tweaking, start the procedure again.

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Buying & Owning

Ian Cushway searches out **new** and **used** parts prices

Suzuki Jimny

The retro-chic fourth generation Jimny is brilliant off-road, cheap to run and you won't lose money if you buy one.

Despite reviews, forum opinions and sheer logic, much of the time car buying choices happen when the heart rules the head. And that's possibly the case with the fourth generation Jimny. Launched in 2018 and on sale here from January 2019 with a four-cylinder 100bhp non-turbo 1.5 petrol engine, its top speed of 90mph confirms it's not a vehicle that's particularly suited to long motorway jaunts. Nor was it particularly thrilling from the lights, either. In fact, it's difficult to find a 0-60mph time which probably speaks volumes. Indeed, it's probably not particularly well suited to modern motoring at all as it uses a lot of old school technology, including – believe it or not – a ladder frame chassis.

So why would you want one, we hear you ask? Well, it's frankly brilliant off-road, with a small lever giving you the option of two- and four-wheel-drive, along with an ultra-low all-wheel-drive ratio for particularly tricky terrain. Instead of employing a traditional lockable rear diff, Suzuki preferred directing torque to the wheels via electronic traction control. Additional driver aids such as hill-hold and hill-descent control, neither of which appeared on its predecessor, as well as a serious amount of ground clearance, gifted the gen-four Jimny with ultimate off-road kudos.

Then there's the charming retro box-like design which makes it like no other vehicle. It's cute and wonderfully charismatic.

Oh, and because it was only on sale for a couple of years, it's rare too – and all those factors combined should instantly make you want to buy one.

There were just two trim levels available, the entry SZ4 with aircon, Bluetooth, 15in steel wheels and six airbags and the SZ5 which added colour-coded door handles, 15in alloys, LED headlamps, privacy glass, climate, heated seats and an impressive 7in infotainment screen. To be honest, though, there's so few for sale you won't have time to do much dithering regarding spec. It will be more a case of checking an over-zealous previous owner hasn't done damage to its underside putting it through its paces at a local quarry.

Interiors are simple and functional with exposed bolt heads reminding you that you're in something pretty utilitarian. There's seating for four, though the back seats, being so small with limited legroom, are only meant for occasional use or for children. The boot was similarly scant in proportions; there's a measly 85-litres with the back seat in place and 377-litres with them folded flat. When the four-seater was

What model?

▶ The big attraction with the Suzuki is its simplicity, and for that reason the minimalist SZ4 gets our vote. Like we've said, though, given their limited supply you might not have much of a choice. Ignore adverts which say, 'every conceivable extra' because in truth, Suzuki never offered any factory fit options. Instead, items such as mudflaps and rubber mats are likely to have been a dealer accessory.

The LCV van version made after the four-seater stopped is an option and you can retro fit the rear two seats if push comes to shove. However, supplies of these are just as limited.

axed due to its emissions, it was replaced by the Light Commercial Vehicle (LCV) version in 2021 which, being classed as a 'commercial' effectively allowed it to duck out of stringent EU emission controls. It had only two seats at the front and therefore significantly more space out back, so if carrying a bike or camping gear is important, this could be an option.

Realistically, being something of a fashion statement, the majority of Jimny's will have enjoyed a sheltered life in town centres and being so new, will come with a fully stamped up main dealer service history, leaving little to worry prospective buyers. But you still need to do your homework first.

Engine component prices

OIL FILTER
Main dealer £17.42
Independent from £6.29

WATER PUMP
Main dealer £79.59
Independent from £51.99

CLUTCH KIT
Main dealer £278.03
Independent from £491.80 (heavy-duty)

Old school 1.5 petrol engine is trouble-free but needs oil and filter changes every 9000 miles.

Engines

As we've already implied, the Jimny's K15B engine wasn't particularly powerful – or refined for that matter. That said, it is strong, reliable and long-lasting – assuming the relatively short 9000-mile service schedules have been strictly adhered to. Timing was via a chain, not belt – so that's one thing you shouldn't need to worry about.

There was a recall issued in 2021 concerning the fuel pump on early cars (along with one for airbag wiring loom) but apart from that there doesn't appear to be any common issues.

There was the option of a five-speed manual transmission and a four-speed auto (on the SZ5), neither of which are problematic, although the long throw of the manual will take a little getting used to.

Suspension/steering component prices

KINGPIN SWIVEL BEARINGS (PER SIDE)
Main dealer £41.32
Independent from £118.50 (kit with seals)

FRONT SHOCK ABSORBER
Main dealer £151.44
Independent from £86.40

Suspension/steering

The Jimny's live rear axle and electronically-assisted recirculating-ball steering is all par for the course in a vehicle such as this so don't expect a huge amount of refinement or driver feel and after a day behind the wheel, you'll know it in terms of fatigue. It's quite sensitive to side winds, too.

Brake component prices

FRONT BRAKE DISCS (PAIR)
Main dealer £155.82
Independent from £131.98

FRONT BRAKE PADS
Main dealer £52.42
Independent from £56.99

Suzuki Jimny 2018-2021

MODEL	SZ4/SZ5 (manual)	SZ5 (auto)
Engine (cc)	1462	1462
Power (bhp)	99	99
0-60mph (secs)	-	-
Top speed (mph)	90	87
Average fuel (mpg)	35.8	32.1

Named as being the most common part failure on the Jimny, you'll probably need to replace the kingpin swivel bearings, especially if they've been exposed to lots of mud and grit. The bottom one tends to go first, and you'll notice oil weeping from the ball on the axle. It's best to replace the halfshaft seal at the same time.

Additionally, if you fit bigger tyres or make suspension modifications you may experience steering angle sensor issues, causing the steering wheel to pull to one side or try to self-correct itself for no reason after hitting a pothole, for example. If this is the case, get it recalibrated.

Brakes

The good news is there's nothing to report regarding Jimny brakes and as you'd expect, there's discs at the front and drums at the rear.

With extreme off-road use, however, the rear drums can fill with mud and wreck the components if left so a full strip down is recommended after a heavy mud-pugging session. To save the bother, it might be worth considering a rear disc conversion – Jimnybits supply a complete kit for £498.61.

What to pay

▶ The entry-level Jimny went on sale in 2018 at £15,879 but because Suzuki pulled the plug two years later after just 2400 had been sold, shortage of supply meant secondhand values actually went up after cars left the showroom and residuals have remained firm ever since. The least expensive example we found was a white 2019 SZ4 with 28k under its belt advertised privately for £20,000. The SZ5 is more abundant in the classifieds and the cheapest of these was one with 61,000 miles on the clock for a grand more, though the going rate is around £25,000 for one with 50-60k. We know it goes against the grain, but the Suzuki main dealer network is probably the best place to source a car – not least because it will come with a good warranty.

Despite being equipped with belts and ISOFIX, rear seats are really only meant for occasional use, or children.

Boot space is miniscule with the rear seats in their upright position.

Despite its utilitarian feel, interior has plenty of creature comforts – including climate control and a 7in touchscreen on the range-topping SZ5.

Other component prices

AIRCON COMPRESSOR
Main dealer £571.79

Running costs

▶ Besides the frequent oil and filter changes, the Jimny won't be particularly expensive to run with group 13-14 insurance, mid-30s MPG and annual VED costing from £190.

Cabin itself is functional, and visibility is good.

Van-like LCV version from 2021 wasn't subject to the same emission controls – but it's just as rare as the four-seater.

USEFUL CONTACTS

4x4 Works	**www.4x4works.co.uk**
BigJimny	**www.bigjimny.com**
Bilstein	**bilstein.com/en**
Charles Trent	**www.trents.co.uk**
Glyn Hopkin Suzuki (St Albans)	**www.glynhopkin.com**
Jimnybits	**www.jimnybits.com**
Jimnystyle	**www.streettracklife.com**

Other checks

Traditionally rust has been a major issue with the pint-sized Suzuki and with age, this could apply to the fourth generation Jimny as well. Check the suspension carriers on the chassis, the inner arches, boot floor and where the rear door hinges fit to the body. If you're lucky and don't find any, take the opportunity to apply additional rust protection.

All Jimny's had aircon, so as a final check make sure it's blowing cold air; if not, suspect the compressor.

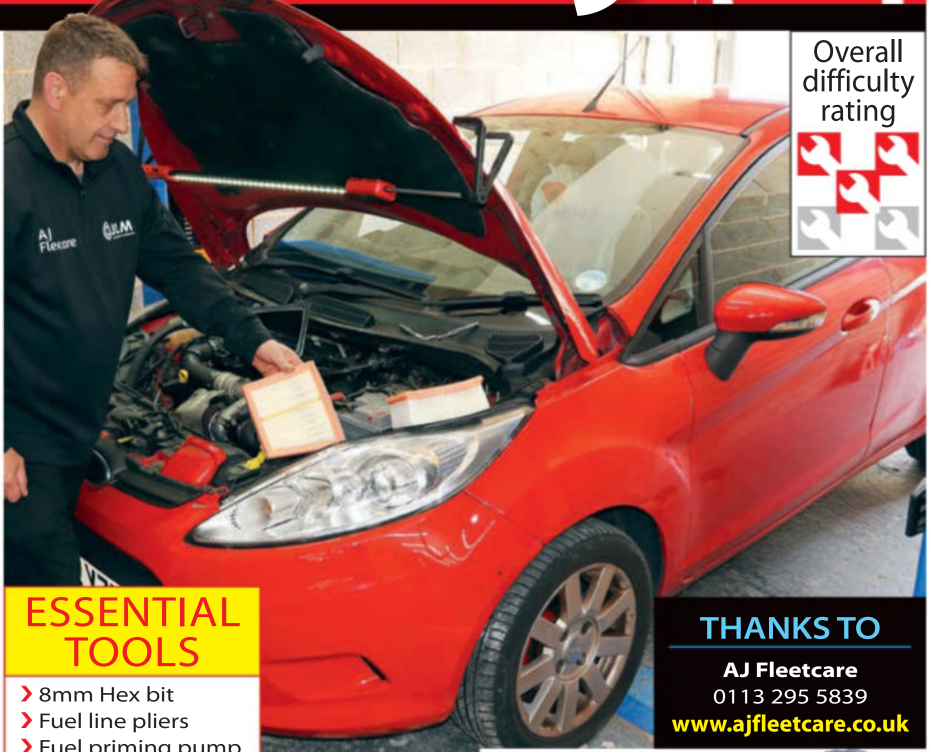
Verdict

▶ If pure commonsense played a part, few people would seriously consider buying a Jimny. However, while far from perfect, Suzuki's quirky mini off-roader has a charm of its own that makes it very desirable. Cult status, however, means it's expensive still. Dearer, in fact, than same age Land Rover Defenders. On the plus side, rock solid residuals make it a sound investment because you're likely to make money rather than lose it when buying one. In that respect, it's free motoring!

2012 Ford Fiesta 1.4 TDCi

Sixth-Gen Fiesta

Rob Hawkins visits AJ Fleetcare of Leeds to follow them servicing a 12-year-old five-door Mk6 diesel engine Fiesta.



Overall difficulty rating

The seven generations of the Fiesta from 1976 to 2023 made it one of the most popular pocket-sized hatchbacks during its 47-year lifespan. Over 4.5 million of them were sold in the UK alone.

We're looking at servicing the penultimate version, the Mk6, which ran from 2008 to 2016, and, in this case, one with a 1399cc turbocharged diesel engine. The history of the Fiesta and its different marks can create some confusion – some sources state that the car we are servicing is classed as the Mk7 and from 2017 onwards it was replaced with the Mk8.

ESSENTIAL TOOLS

- 8mm Hex bit
- Fuel line pliers
- Fuel priming pump
- Torx: T15-T30

THANKS TO

AJ Fleetcare
0113 295 5839
www.ajfleetcare.co.uk

We spoke to the owner of the vehicle shown here, who admitted that she hasn't covered many miles (the milometer displays less than 60k), but looking at the MOT history, it hasn't escaped from the usual wear and tear issues, such as fractured suspension springs and worn balljoints. There are also common problems, particularly for vehicles with red paintwork, such as peeling lacquer, which in this case is across the rear roof/tailgate spoiler! And corrosion is something that requires a careful watch because the Fiesta's rear axle assembly can become insecure (see *Rob Says* above).

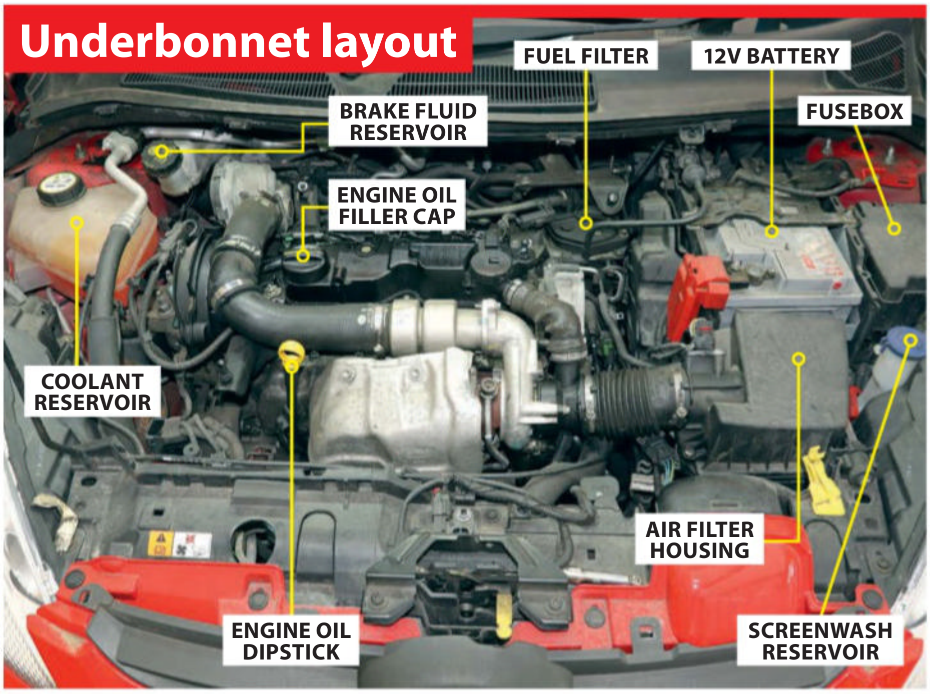
Rob says

▶ There's a trailing arm-style beam at the rear of the Fiesta. Some garages have informed us they've found that corrosion of its mounting points on the bodywork has become so bad that the whole rear axle assembly can move under harsh braking but may not be identified at the MOT test. So, it's essential to inspect the condition of the bodywork on the underside of the vehicle, but to also test-drive it and conduct an emergency stop.

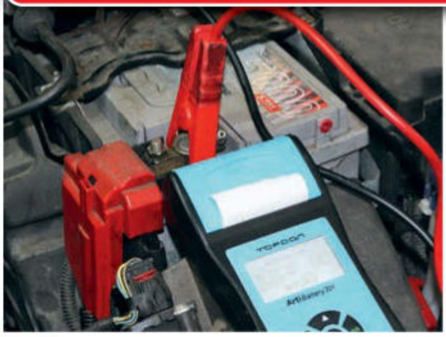
Servicing the Fiesta isn't too complicated and access to all the components is very good. The fuel filter is perhaps the most difficult and time-consuming item to replace, so we've outlined it in detail. If you are at all unsure, don't do it and run the risk of causing a fuel leak – ask a garage to do it for you.

The cooling system should contain 6.1 litres of orange-coloured liquid to WSS-M97B44-D specification, which should be drained and refreshed every 10 years or 112,500 miles (at the same time as replacing the timing belt assembly, auxiliary drive belt and water pump). We found on the Fiesta shown here that the coolant was pink-coloured, suggesting it's a different type that should usually be replenished every five or six years.

Underbonnet layout

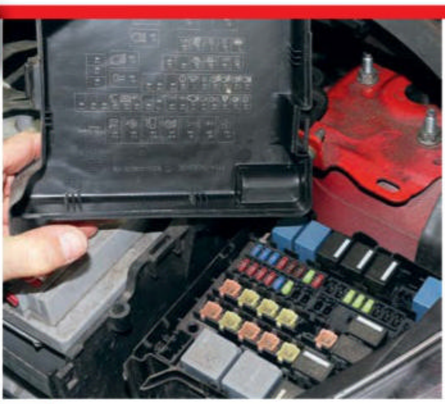


UNDERBONNET CHECKS



1 TEST BATTERY

The battery is in the nearside of the engine bay. Check its voltage with a multimeter or check it using a battery tester. Our photo shows a Topdon battery tester checking the cold cranking amps (CCA) of the battery and concluding that it needs to be replaced.



2 INSPECT FUSES

Release the plastic lid of the fusebox in the nearside of the engine bay. Look inside for water ingress and corrosion. If any fuses have blown or electrical equipment is not working, there's a key on the underside of the lid to help identify each fuse.

3 TOP UP SCREENWASH

Release the blue-coloured lid for the screenwash reservoir in the nearside front corner of the engine bay. Pour a diluted mixture of screenwash in until it's full. Operate the wash/wipe for the rear and windscreen wipers to check the spray pattern.

4 CHECK BRAKE FLUID

Shine a torch on the side of the brake fluid reservoir translucent reservoir to check the level against the MIN and MAX markers on the offside of it.

5 CHECK COOLANT LEVEL

The level of coolant inside the expansion tank can be visually checked. Make sure it's between the minimum and maximum markers. If it needs topping up, ensure the engine is cold before releasing the pressure cap. Top up with orange-coloured WSS-M97B44-D or whatever has been used before.

TOP TIP

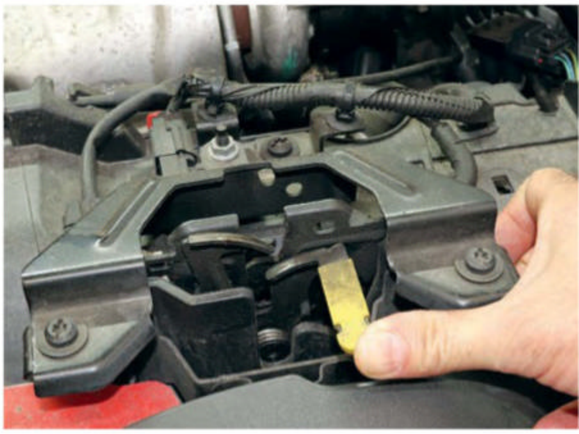
The coolant system's capacity is 6.1 litres.

6 SQUEEZE HOSES

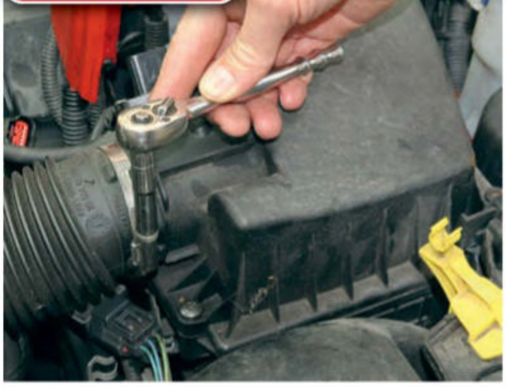
Providing the engine is cold, squeeze any coolant hoses inside the engine bay to look for signs of perishing. Trace each hose to its end and check they are securely fitted. Look for traces of coolant residue that may signify a leak.

7 LUBE BONNET RELEASE

Spray a light grease over the bonnet release mechanism at the front of the engine bay (in the centre of the slam panel). Work the release catch back and forth to ensure it moves freely.



AIR FILTER

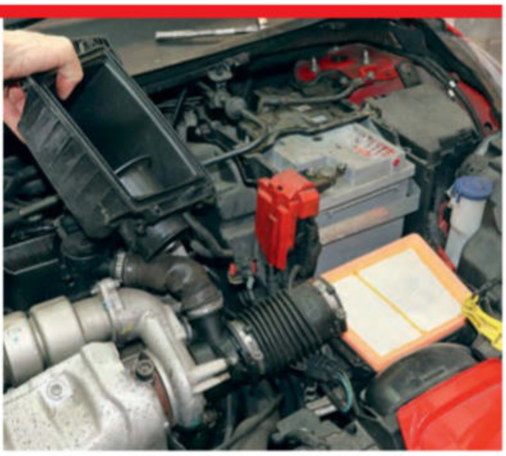


8 SLACKEN HOSE

The air filter is contained inside a plastic housing. It can help to loosen the hose that's connected to the side of it by slackening its hose clip, although there's space to simply lift the lid and swap the air filter.

9 REMOVE LID

Detach a wiring plug attached to the lid of the air filter housing, then undo four Torx T30 screws that secure the lid in position. These screws cannot be removed – they remain attached to the lid, even if they have been fully undone. Lift the lid up to expose the air filter.



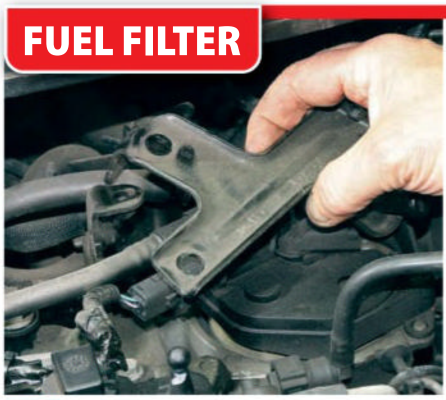
⇨

AIR FILTER CONTINUED

10 CHANGE AIR FILTER

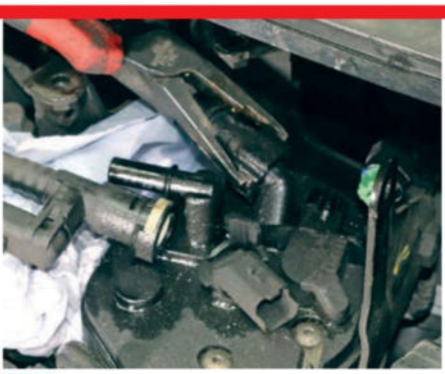
Extract the old air filter and clean inside the housing with paper towel to remove any dirt that could contaminate the new one. Fit the new filter, making sure its rubber edges are seated inside the housing. Refit the lid of the housing, the electrical plug and then tighten the hose clip if it was slackened.

FUEL FILTER



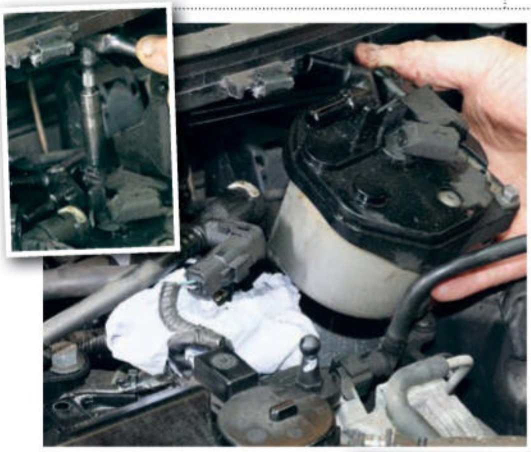
11 REMOVE MOUNTING BRACKET

The fuel filter is at the back of the engine bay, close to the nearside. Remove the engine cover (it sits on locating lugs, so pull it upwards). A mounting bracket for the engine cover (shown here) needs to be removed. It's secured with three 8mm bolts.



12 DETACH FUEL PIPES

There are two fuel pipes attached to the top of the fuel filter. They are a quick-release design, so use a pair of fuel line pliers to pinch the white inserts and release each one. Place paper towel underneath them to catch any fuel that leaks. Detach an electrical plug from the top of the filter (for the fuel heater).

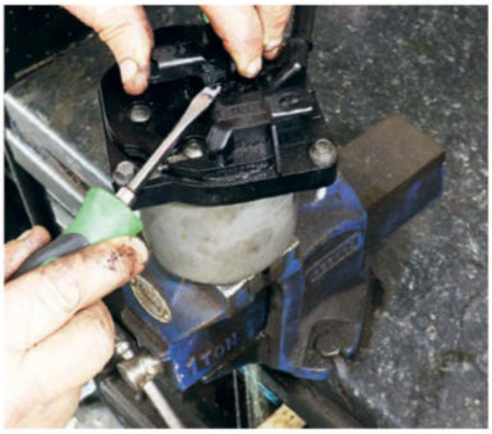


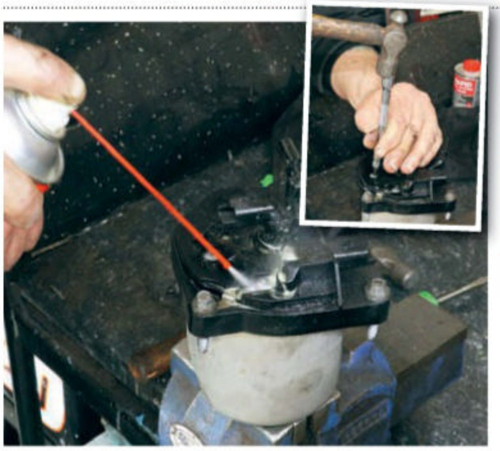
13 REMOVE FUEL FILTER

Undo a couple of 8mm bolts, accessed from the top of the fuel filter, which mount it in position. These bolts can remain in situ but, after fully slackening them, the filter can be removed from the engine bay. Keep it upright as it will be full of fuel.

14 DRAIN FUEL

Secure the fuel filter in a vice and position a bowl underneath it. Turn the connector plug socket in the centre (for the water sensor) to unlock it (see Step 19 for more details). Use a small flat-blade screwdriver to lever it up a little and allow the fuel inside to drain (as shown).



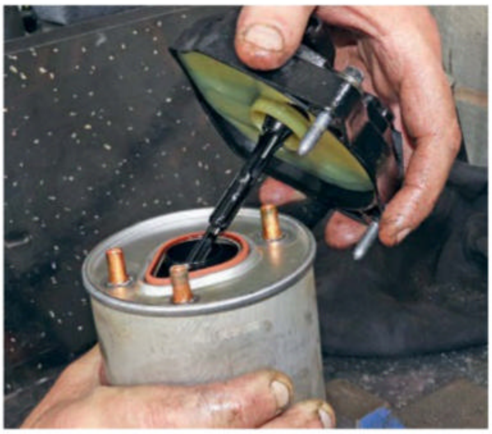


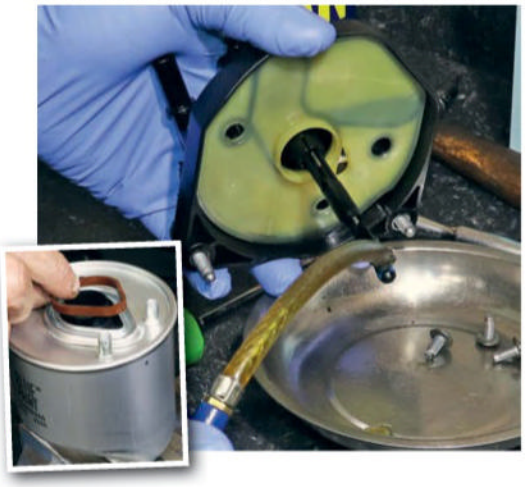
15 UNDO HOUSING BOLTS

Alan at AJ Fleetcare says the three Torx T15 screws that secure the top of the fuel filter housing to the fuel filter can be seized and risk shearing a Torx bit. So, he always applies penetrating fluid and then shocks them with a hammer before trying to undo them.

16 REMOVE FUEL FILTER TOP

After undoing the three Torx T15 screws, the top of the fuel filter (the housing) can be removed. The long plastic drain/water sensor is attached to the underside, so be careful not to damage it because this doesn't get replaced.





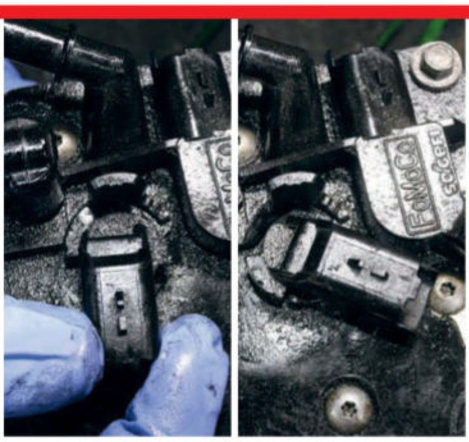
17 REPLACE FILTER

Discard the old fuel filter and secure the new one in a vice. Fit a new seal into the hole in the top. If a small seal is included with the filter, fit this around the long plastic drain/water sensor on the underside of the lid – apply a light oil to the seal (new or old) to prevent it catching when fitting it into the new fuel filter.

18 REFIT FILTER TOP

Carefully lower the top of the fuel filter inside the new fuel filter. There's only one position it can be fitted, so don't force it if the lid won't sit flush with the top of the fuel filter. Refit the three Torx T15 securing screws.

BLUE PRINT
ADM52350

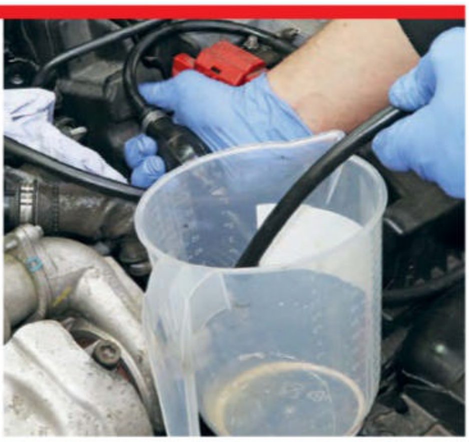


19 LOCK THE LID

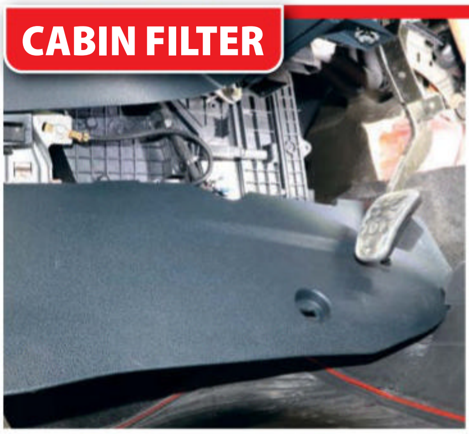
It's important to lock the water sensor socket in the centre of the lid to prevent fuel leaks. Push down and turn this plug socket to the lock position shown here. It's an awkward part of the job, but needs to be done to ensure fuel doesn't leak from the base.

20 REFIT AND PRIME

Refit the fuel filter, connecting the rearmost fuel pipe (the feed from the tank). Attach a hose and fuel priming pump to the frontmost outlet on the top of the fuel filter. Draw fuel through and collect it in a jug. Refit everything, run the engine and check for fuel leaks.



CABIN FILTER

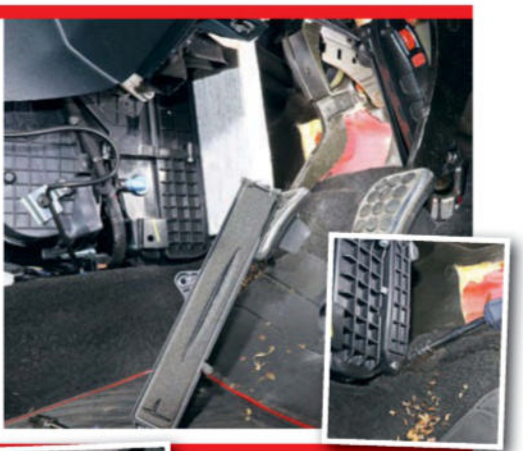


21 FIND THE FILTER

The cabin filter is located behind a long trim panel in the driver's footwell. Release a plastic trim plug for this panel, which is fitted against the centre tunnel. Pull the plastic panel away to release its metal spring clips that help to secure it in position.

22 SWAP CABIN FILTER

Undo a single Torx T20 screw that locates an oblong-shaped small plastic cover for the cabin filter. Remove it, then extract the cabin filter. Fit the new cabin filter, ensuring any airflow arrows are pointing to the rear of the vehicle. Refit the cover and the trim panel.



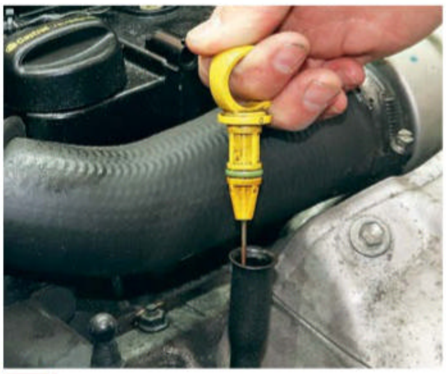
OIL & FILTER

23 REMOVE OIL FILTER

The oil filter can be accessed from the engine bay (near the air filter housing). Undo the plastic canister using a suitable-sized socket, then carefully extract it to help with draining the engine oil. Replace the seal and filter inside the plastic canister, but don't refit it until after draining the oil (tighten it to 25Nm).

24 DRAIN OIL

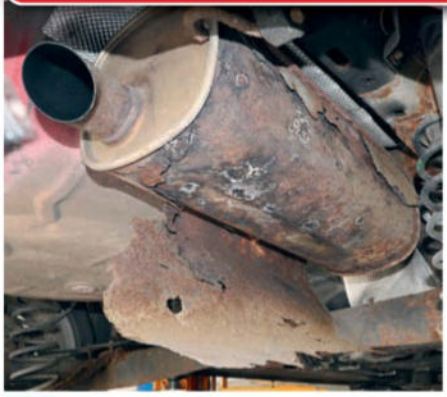
From underneath the vehicle, remove the fabric undertray by undoing a couple of Torx T30 screws at the rear and whatever is fitted along the front edge (cable ties in this case). With a suitable container underneath the sump, undo the 21mm drain plug and leave the oil to drain.



25 REFILL ENGINE OIL

Fit a new drain plug, tightening it to 35Nm. Measure 3.8 litres of 5W-30 fully-synthetic engine oil (WSS-M2C913-C or D specification) and pour it into the engine. Check the level on the dipstick, which should be around the three-quarters mark. Top up, if necessary, then run the engine, check for leaks, switch off and check the level again, topping up if required.

UNDERSIDE INSPECTION



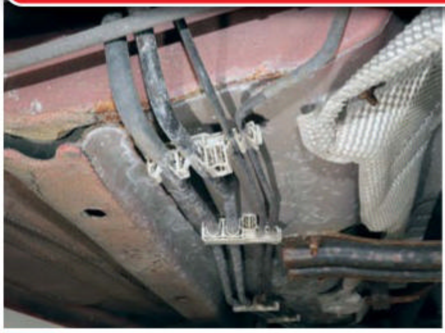
26 INSPECT EXHAUST

Look underneath the vehicle to inspect the condition of the exhaust mounts and any rubber hangers (look for perishing of the rubber). The rear silencer shown here has shed its outer casing, so it needs renewing.

27 CHECK SPRINGS & DAMPERS

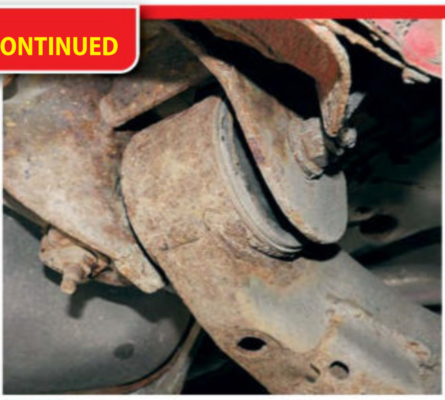
Visually inspect the condition of the rear coil springs, looking for corrosion and fractures (including the metalwork where each spring sits). Look around the body of the telescopic dampers for leaks (misting) and lever a pry bar against each one's lower mounting bush to check for excessive movement.

UNDERSIDE INSPECTION CONTINUED



28 INSPECT PIPEWORK

Check the brake pipes, attached to the rear brake drums, for corrosion. There are also brake and other pipes routed underneath the centreline of the vehicle, so inspect these and ensure they are securely fitted and not damaged or corroded.



29 CHECK TRAILING ARM BUSHES

Visually inspect the condition of the rear trailing arm bushes, looking for perishing of the rubber, which could result in handling issues. Check the condition of the bodywork where the trailing arm bushes are mounted to ensure there's no structural corrosion.

30 INSPECT TANK STRAPS

The fuel tank is fitted underneath the vehicle, close to the rear. It's secured with a couple of tank straps, so inspect them for corrosion and make sure their mounting bolts, which are threaded into the bodywork, are secure.

31 GEARBOX & SUSPENSION MOUNTS

Use a pry bar to check the condition of the lower gearbox mount and also the mounting points for the front lower suspension arms. Check the condition of the lower suspension arms, looking for excessive corrosion.

32 PINCH BOOTS

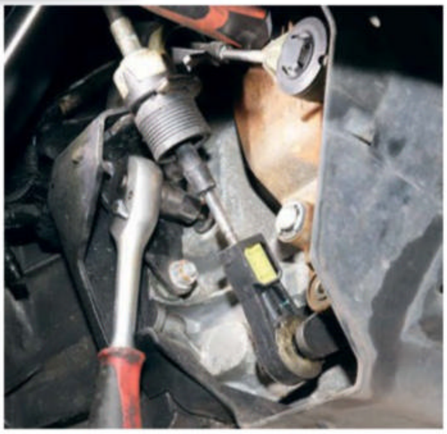
Behind the front road wheels, squeeze the corrugated rubber gaiters on the ends of the driveshafts and pinch the rubber dust covers on the ends of the steering track rod ends. Any splits in these rubber components may allow grease to escape and water and dirt to get in, resulting in premature wear.

33 INSPECT FRONT COIL SPRINGS

The front coil springs can be visually inspected over the tops of the tyres, which is easier if the front of the vehicle has been raised. Look for corrosion and fractured coils.

34 CHECK GEARBOX OIL LEVEL

With the undertray removed, detach a plastic panel on the front face of the gearbox to expose the gear linkage and a filler/inspection plug. Undo it using an 8mm Hex bit to check the oil inside is just below the inspection hole. If it's low, top up with 75W-90 gear oil (Ford's classification varies according to production date on the gearbox).



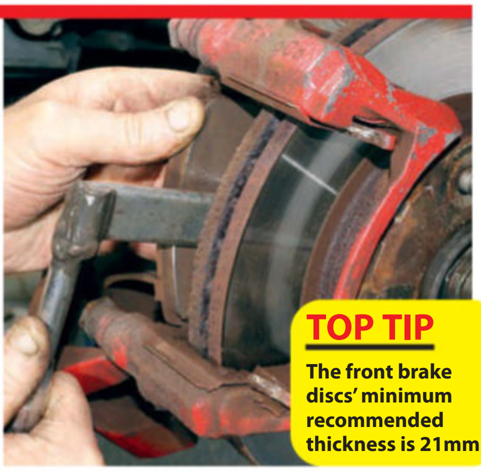
FRONT BRAKE CHECKS

35 UNDO SLIDER BOLTS

Stripping and cleaning the front brakes is worth doing. After removing the front road wheels, undo the 12mm upper and lower bolts that are threaded into the slider pins. If a pin rotates when undoing its bolt, hold it with vice grips. Prise the caliper off and suspend it over the brake disc.

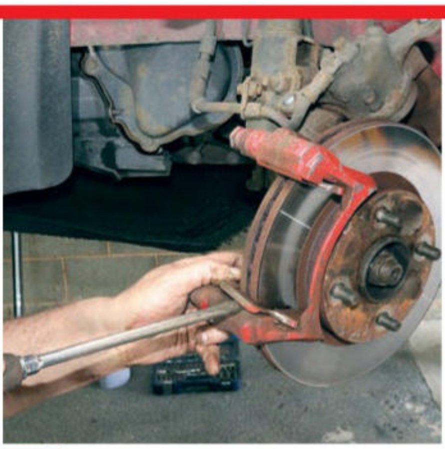
36 EXTRACT BRAKE PADS

After removing the caliper, the inner and outer brake pads should remain attached to the carrier. Prise them out and check the depth of their friction material, which should be at least 1.5mm. If they can be reused, clean the edges and backs with a wire brush.



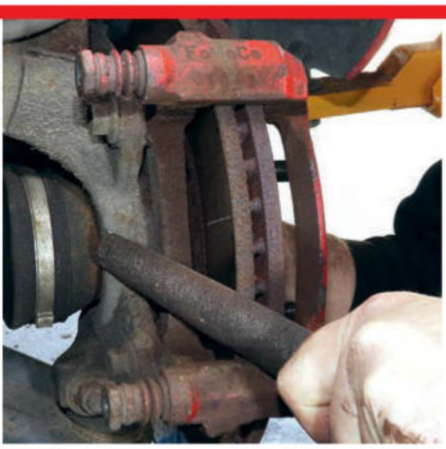
TOP TIP

The front brake discs' minimum recommended thickness is 21mm.



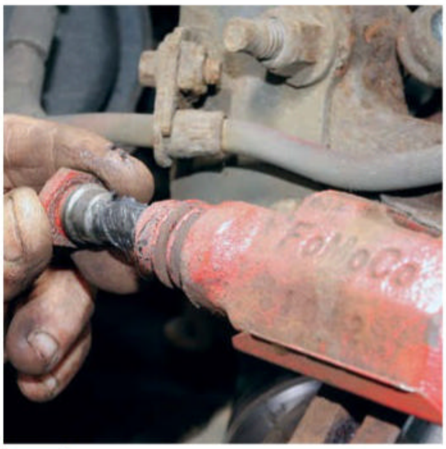
37 REMOVE SHIMS

Remove the upper and lower metal shims fitted to the caliper carrier (the brake pads sit against them). Clean the areas of the caliper carrier concealed by these shims. Dirt can build up here, making it difficult to fit the brake pads. Afterwards, refit the shims.



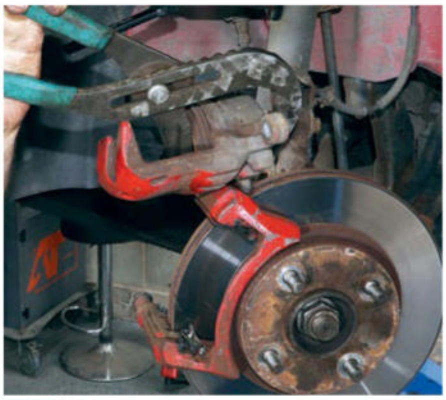
38 CLEAN DISC EDGE

Hold a flat file against the edge of the brake disc, then carefully rotate it by hand to remove any corrosion from it. Move the position of the file to clean all the outer edge of the brake disc. If left, the dirt and corrosion can contaminate the brake pads.



39 LUBE SLIDER PINS

Extract the slider pins from the caliper carrier and check the condition of the rubber boot – replace it if it's damaged. Clean each slider pin if it's corroded or covered in dirt, then apply a high-melting-point grease before refitting it.



40 RETRACT PISTON

Alan at AJ Fleetcare always sprays a little maintenance spray down the walls of the caliper's piston before retracting it with water pump pliers. This helps to keep it free-moving and reduces the risk of dragging and tearing the rubber dust cover. Next, clean inside the caliper to remove any dirt.

41 FIT BRAKE PADS

Refit the old brake pads if they can be reused or replace them if they are worn (as shown here). Apply a smear of brake grease to the top and bottom edges. In our case, the inner brake pads had an audible wear sensor (metal clip) attached to the base of each inner brake pad.

42 PRESS BRAKE PEDAL

Refit the caliper with its two 12mm bolts, tightening them to 28Nm. With the brake service complete, press the brake pedal to push the pistons out. Check the level in the brake fluid reservoir – it may be too high if new pads have been fitted, so the excess will need extracting with a syringe.

SERVICE SCHEDULE

RECOMMENDED SERVICE SCHEDULE

EVERY 12,500 MILES or 12 MONTHS

- Change engine oil & oil filter
- Change cabin filter
- Check coolant level & test concentration
- Check tyre condition, pressure & tread
- Top up screenwash fluid
- Check battery
- Check wiper blades & washer jets
- Check all underbonnet components & hoses for fluid leaks
- Inspect brakes
- Check steering & suspension components
- Check auxiliary drive belt
- Inspect exhaust system & mountings
- Check operation of all electrical systems
- Lubricate all locks & hinges
- Check brake fluid for moisture content

EVERY 24 MONTHS

- Renew brake fluid

EVERY 37,500 MILES or 36 MONTHS

- Renew air filter
- Renew fuel filter

EVERY 120 MONTHS

- Refresh coolant

EVERY 112,500 MILES or 120 MONTHS

- Renew timing belt and tensioner
- Renew auxiliary drive belt

Don't forget to also

- Check tyre tread depth and inspect the sidewalls for perishing and damage.
- Check wipers for splits in the rubber.
- Lube locks and hinges.
- Check boot for water ingress.
- Tighten wheel bolts to 110Nm.

Help!

Your *non-diagnostic* vehicle-related problems solved by **Steve Rothwell**

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FORD MONDEO

Transmission clunk

Q You may remember I asked about the auto transmission oil change on my 2006 Ford Mondeo 2.0 LX? I had my local mechanic replace the oil and all is well except that it seems when the engine is running from cold, when you come to pull away there is a clunk that sounds like the drive taking up, it only happens when pulling away from cold and only seems to happen once.

My mechanic checked the oil level again and its OK, no leaks from anywhere. Have you any suggestions why this should happen?

Geoff Allen

A **If this problem has only occurred since the oil change, then I would ensure that the correct fluid was used. It may be that the viscosity of the fluid is incorrect and is causing issues. The fluid which I have as being the correct fluid for your Mondeo is ESPM-2C166-H and as these Ford automatic gearboxes were designed to take the specific oil, putting the wrong fluid in could be affecting the operation.**

If the correct fluid has been used it may be the case that in the oil change debris has been allowed to circulate and it may now be causing an issue, I would suggest attempting another oil change and possibly removing the sump pan to ensure that the internal filter is clean.

If the noise was there before the oil change and this has not altered, then it may be the case that normal wear and tear in the drivetrain is allowing the slight clunk that is heard when pulling away from cold.

It is difficult to say without hearing the noise if this is an issue, but given that this is only a light clunk when cold then I would suspect that this may be nominal wear, and provided a check of the driveshaft joints and area does not bring anything to light, and provided that the engine mounts are secure, then I would suspect that this is not a concern at this time.

GENERAL

GENERAL

Winter salt remover

Q Our cars are well protected on the underside and in cavities with a maintained protective wax coating. I am very aware though that the road salt liberally applied during our winters needs to be washed off regularly which, although a rewarding process using a light hose a variety of brushes and a tar type product can be a bit unpleasant shall we say!

Interested to know your thoughts about any products you may be aware of which have an ability to neutralise the salt effect?

If there is such a product it could be more effective than my current method?

Alan Worland

A **The severity of the winter and the level of salt used can vary, it can also be the case that some salts are mixed with a sand, and this has the ability to stick to the underside of the vehicle which will cause damage if left.**

In many cases a good spray underneath will clear the salt and be sufficient to ensure that none of the corrosive matter is left in place, but there are products on the market which are designed to neutralise the salt and so prevent the corrosive action from taking place.

Some of these products such as Everbuild Salt Away are designed primarily for the building trade to remove the salt residue from bricks or stone, but the chemical formula is also ideally suited to neutralise the salt residue on the underside of a vehicle.

CHLOR-X
201
CHLOR-X
201
CHLOR-X
DTS

The CHLOR-X SALT REMOVER which will help in the effort to prevent corrosion during winter.

CHLOR-X SALT REMOVER is specifically sold for the use on the underside of vehicles to neutralise and remove any salt deposits after the rigours of winter. The product is available in one or five litres and can be purchased ready to use or in a concentrated formula. Available from www.rust.co.uk.

Finally, another product to consider is one designed primarily for boats, that is STAR BRITE Salt Off Protectant. This does have protective polymers as well as the salt neutralising qualities and so is the most expensive of the three choices.

Preventive action is always the best option and cleaning the underside of the vehicle with just water if it can be done immediately would normally be sufficient, but if the salts are allowed to remain for a period, then using one of the neutralisers would be a good option.

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FORD FIESTA

Gear selection

Q My daughter has a 2017 Ford Fiesta 1.0 EcoBoost with Stop-Start, which she has had from new. It has now completed 55k. The problem has arisen over the last six months, and it is not consistent and only happens every so often.

The engine will be maybe running OK, then she will pull up at traffic lights or at a junction and the engine cuts out. She puts it into neutral, then on restarting it she attempts to put it into gear and the lever is solid and will not move under any circumstances.

She then stops the engine and restarts it, and the gears are normal until the next time. I have tried all kinds of things such as switching the Stop-Start off and I have checked the clutch solenoid out on the pedal, but to no avail.

This is an extremely dangerous situation especially in traffic, I have asked several mechanics at local garages and not one of them has heard of this situation before.

Please advise your thoughts on this?

Wes Stoker

A **As you mention checking the clutch solenoid, I am presuming that this is the manual gearbox and not the automatic unit. I am also presuming that when this problem occurs that the clutch pedal does feel normal, or I suspect that this would have been mentioned.**

Under these circumstances, the problem is not easy to identify, and as this is an intermittent problem this makes matters more difficult.

As the gear lever does operate without issue to select neutral but then refuses to select gear, then I would suspect that the issue may be in the gear selection cables at some point. This may be in the base of the gear-lever or possibly a fault within one of the cables or the mechanism at the gearbox end.

As mentioned, intermittent and occasional problems can be difficult to diagnose, but I would start by disconnecting the gearchange cables at the gearbox end and then feeling the operation to ascertain if any resistance is present in the cables.

If there is a problem, I would expect it to be identifiable and with the cables disconnected this should be easier to find.

If the problem were to do with the clutch operation, then the gear-lever would move a certain amount, and as you describe it as being solid, I would certainly concentrate on the area of the cable operation.

FORD FIESTA

Tappet question

Q Please can I ask some supplemental questions regarding tappet adjustment on my 1998 Ford Fiesta 1.3? Do stiff nuts used on tappets sometimes loosen after adjustment? I have read of gaps opening again shortly after being set. Is a ring spanner better to use than a socket when adjusting these nuts?

Before experimenting with turning the engine with the road wheel in fifth gear, I took the plugs out with a ½-inch spark plug socket. I found them very hard to undo and an insulator on one spark plug shattered as my socket went off-centre. I got it out without any ceramic going down the hole and replaced it with a new one.

Should you put a drop of oil on threads of plug to prevent seizing? I had put new NGK plugs one year ago tightening them 1/16 turn as per the box.

Does Cataclean remove dirt from the back of the inlet valves and so close the gap on the rocker arm? Thanks for your help again.

Andrew Rosier

A **It is not normal for the locking nut on the tappet adjustment screw to loosen. Once tightened this should normally remain firmly in place. The use of a ring spanner does allow the adjusting screw to be held in place whilst tightening the locking nut and this is a better option. The loss of correct adjustment is often due to the adjustment screw turning as the locking nut is tightened.**

The spark plug torque is 17Nm and no lubricant should be used on the thread. The removal using a ½in-drive socket and extension can allow a little movement, and it is often easier using a short extension with a 3/8in-drive set. The key is to ensure that the socket does not move sideways during the process.

Cataclean will remove the carbon from the back of the valves, but it is unlikely to affect the adjustment as this is dependent on the face of the valve sitting in the seat. Unless the carbon was extreme this should not be affected.

Valve seats will wear over time, and this may allow the gap at the rocker to lessen, but It is normally the case that wear in the rest of the rocker system will be greater allowing the gap in service to increase.

FORD RANGER

Oil change

Q Talking to a Ford mechanic he told me that an oil change on a Ford Ranger must be done in 20 minutes, or it wouldn't pick up the oil. Is this correct please? Thanks.

Alan Price

A **The problem of the oil not getting picked up when starting the engine after an oil change is something that can occur across a range of vehicles and is something that many years ago, I experienced with a VW Golf.**

The problem is not with the overall time that the oil change is completed in, but more to do with the amount of time the oil filter is left removed for. It can occur that when the sump is empty after draining that the oil, and then the oil filter is removed, the oil in the gallery can drain back down into the empty sump and so leave the oil gallery and the pump empty of oil.

When the filter is then replaced and the oil is refilled, the level of oil in the sump although above the level of the oil pickup is not above the oil pump and so the pump empty of oil will not operate sufficiently to draw the oil up. This will result in oil not being primed through the system.

In the case of the VW that I had this experience on, I simply removed the oil filter again and primed the oil galley and supply system from the filter – this then allowed normal operation to be resumed. I have heard of garages flooding the engine with oil to overfill the sump and so allow the excess oil to fill the pump. If this is done the sump will of course need to be drained back to the correct level.

So while I would say draining the sump for an extended period to allow as much of the old oil to be drained from the system would cause no harm, I would advise that the oil filter should not be removed and left off, and the new filter should be fitted as soon as possible to prevent the possibility of the oil draining back down the system leaving the gallery empty.

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FORD CONNECT

Judder

Q After changing the shocks on my 2006 Ford Connect this has led to other issues. A judder/shuddering thereafter when moving off through 1-2 gears felt under the seat and a gear lever slight vibration and doesn't like hills.

If I stay under 2000rpm in 1st and 2nd and gently nurse the take off with rpms, it's less judder/shuddering. I purchased another set of new CV driveshafts from local factor and fitted them, no change. Remaining gears 3-4-5 are OK.

Next, new engine mounts (L+R) and the stabiliser mount for gearbox – no change.

As both shocks were pre-assembled shock/spring/top mounts (all new) sleeve and bump stop could these be at fault?

As my thoughts are it was OK until, we changed the shocks.

My friend is a mechanic with own his business suggests we put the old shocks back in. I changed them because of age (147,000 miles). His buddy who owns another garage, points at gearbox and suggests it could be diff in gearbox or gears or clutch issue.

I've never changed the clutch and as it's ex-Royal Mail van – there's no mention of clutch change in service history.

Both mechanics are insistent it's a drive issue and not the new shocks, hence putting in another new set of CV shafts followed by engine mounts, etc., trying to resolve the juddering. The 'box has been selecting gears OK. We also then changed gearbox oil – another £33.

So far £560 in parts, labour was free fortunately – mates rates couple crates of cider. Any thoughts are well received. If it is gearbox then obviously, I will find a second-hand one and put in a new clutch, but it's all more money.

So general thought was for me to continue to use it and see if it gets a worse. Which I have been doing about 100 miles a day over last three weeks for courier work lots of stop/start.

Look forward to your fountain of knowledge thoughts.

Antony Tucker

A My first thought, as the judder was only present after the fitting of the new front shock absorbers, is that something disturbed in this area is the source of the problem.

The most likely area of this may be the front bearings and it could be due to the driveshaft/joint not being correctly seated within the bearing. I would consider disconnecting the joint and ensuring that the joint will move freely within the bearing, the front hub should be tightened to a setting of 320Nm and if this is not correctly set, or if the joint is tight within the hub, then this could affect the drive.

If after checking the front hub bearings and ensuring that when loose the joints are moving freely in and out, then another possible reason may be the inner driveshaft support bearing on the offside. This though is less likely as this should not have been disturbed during the previous work.

It is of course possible that this judder occurring is a coincidence and not related to the earlier work carried out, but as you have replaced the engine mounts and the stabiliser bushes, this does cover the other areas I would have recommended.

One other check would be to ensure that the brakes are not binding at all, although again if this were the case, I would expect a wider range of problems to be present.

VAUXHALL ZAFIRA

Spare wheel fitting

Q I recovered the spare wheel carrier and fittings from my old Zafira B with a view to fitting it to my 2017 newer model. Problem – I am unable to remove the decked storage box panel (GM part number 13366364) or do I have to modify it in some way to fit the cradle retaining bolt.

Also, the above vehicle has alloy wheels, having a steel wheel as a spare – would it make any difference to the TPMS?

Paul Dunn

A Starting with the tyre pressure monitoring system. There are two types that may be fitted to the earlier Zafira B, and they are the passive or active systems. If your earlier Zafira has the passive system, then the wheels will not have a tyre pressure monitor fitted, as this system uses the ABS to calculate the speed rotation of each wheel to determine if the tyre pressure is low. If your earlier Zafira has the active system, then the wheels will be fitted with a pressure monitor.

The details I have say that the system will be reset after tyre pressure adjustment. After tyres have been removed, replaced or repaired, and after wheels have been changed to different positions on the vehicle or different wheels or tyres have been fitted. This is done by leaving the vehicle stationary for 20 minutes and then driving for a minimum of 10 minutes above 25mph.

It is unclear if this will be affected by any pressure monitor that may be in the spare you are proposing to fit.

The storage box fitted to your Zafira C should be GM part number 13295817. This should be removable. The spare wheel carriers on the Zafira B and C are different, the part number for the Zafira B being 13285262 and the kit for the Zafira C being 13275550. This kit for the Zafira C is also twice the price of the kit for the Zafira B and does only appear to house a space-saver wheel. Unfortunately I have not been able to compare the units to see what the difference is.

VAUXHALL ASTRA

Jammed door

Q The passenger door on my 2012 Vauxhall Astra J 2.0 will not open from either the inside or the outside handle. The button lifts up and pushes down. I have cut a hole in the door card to access the linkage which I can see moving but the door will not release.

I can hear a clicking when the central locking is operated but the door remains firmly locked. Can you advise me of what I should do next?

Clive Castle

A The fault you are experiencing of the door not opening, even though the handle appears to be operating correctly, is normally due to the deadlock mechanism in the lock jamming preventing the lock from opening. This is a problem I have come across before, and the lock does jam internally.

One method that does sometimes work is to operate the central locking at the exact same moment as attempting to open the door – this can be in the lock or unlock position, and it does sometimes free things off.

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VAUXHALL MERIVA

Low power

Q I should be grateful for your advice regarding a problem with my daughter and her husband's 2009 Vauxhall Meriva Active 1.4. My son-in-law is not mechanically minded and is reliant on a garage if the car needs attention, and my own knowledge of modern car technology is limited, mainly from reading *Car Mechanics*.

During the summer the car started to lack power and struggled to get up hills. My son-in-law took it to his local garage, who claimed to have fixed the problem, but a few weeks later it was just as bad, and became worse when he and my daughter drove the 60 miles to us for a visit. Apart from the engine problems the brakes were poor.

As the car was virtually undrivable at that point, I managed to get our village garage to look at it. They found that the inlet manifold was in poor condition and there was a small hole in it which had been bodge-repaired with a screw.

A replacement manifold was the only solution, but they were unable to source a new one in this country. In fact, the only one they could locate was in Europe on eBay, and this was obtained and fitted. This was six months ago, and the car was fine afterwards. An MOT was passed a couple of weeks later with a few advisories, but the CO and HC appear to have been OK. A full service was carried out three months ago (by a different garage to the one which "fixed" the inlet manifold), and this included new spark plugs, battery, oil change and oil and air filters. The car ran well afterwards.

My son-in-law advises that the car now again lacks power and struggles up hills, and although it drives normally on the flat at speeds up to about 50mph, on the motorway it barely reaches 70mph even with his foot to the floor. I understand that the brake servo is working properly, and that there is no smoke from the exhaust. On their last visit I checked for fault codes with my Foxwell NT 680 Lite, and the only one showing was P0136-5, indicating an intermittent O_2 sensor circuit malfunction Bank1 Sensor2. Is this the sensor on the exhaust manifold, or the one in the exhaust front pipe?

I appreciate I have been unable to give you much information, but perhaps you can suggest what could be wrong or what tests are required. Thank you in advance for your help.

Dave Kilhams

CRC
Mass Air Flow Sensor Cleaner
Limpiador del sensor de flujo de aire
Evaporates in Seconds
MPG
4-10
AFR
REAL TESTS • REAL RESULTS
Net Wt. 11 oz (311 g)

Using a MAF cleaner such as this one may help with the problem.

A From the description of the previous troubles, I would suspect that the problem was due to a failed inlet manifold, and this would have reduced the vacuum available to the servo giving the poor brake feel. With the manifold now renewed, I would hope that the problem now is not related to the earlier incident.

The code P0136-5 is referring to the Oxygen Sensor 2. This is the sensor located after the catalytic convertor. The code is specifically referring to a circuit malfunction in the heating circuit for the sensor. This could be due to a failing O_2 sensor or the wiring from the ECU to the sensor. I wouldn't normally expect this to be the source of the lack of power that Is being experienced.

One of the common reasons for low power, and one that will not normally leave a code is a failing MAF sensor. This will give an incorrect air ratio to the ECU and prevent the system from then delivering sufficient fuel. This would be the first point to check.

There are a couple of quick checks that can be done using a voltmeter, the first is to ensure that the MAF sensor wire at terminal 4 (Red wire) has a 5-volt feed and the wire at terminal 2 (Yellow wire) has a 12-volt (or battery voltage) feed.

The next test is to ensure that the signal the MAF sensor is giving is accurate, this is done by placing the voltmeter probes between terminals 3 and 5 (Blue wire and White wire).

With the ignition on, the reading should be 1 volt, with the engine idling this should rise to 1.3 volts and a quick blip of the throttle should see the voltage rise to around 4.2 volts.

I can see from the MOT details that the mileage is over 100,000 miles and so it may be worth cleaning the MAF sensor as this may make a marked improvement. The MAF sensor can be cleaned with either Isopropyl alcohol or a dedicated MAF cleaner spray, or an electrical contact cleaner spray such as this one https://bit.ly/CMjbsCs can also be used.

The important point to note is that the hot wire element of the MAF sensor should not be made contact with, and the sensor should be perfectly dry before the engine is started up after cleaning.

One other reason for the loss of power may be due to the EGR valve – this may be coated with carbon and can give symptoms very similar to those that were present when the manifold problem occurred. Whilst a faulty EGR valve would normally give a fault code, it is possible that carbon is causing a problem which is not being detected, and for this reason I would also consider cleaning the EGR valve.

There are dedicated cleaners for this purpose, or a less intrusive option would be to use a system cleaner additive in the fuel tank, this may improve the situation of a short period of time.

If this does not work, then the only way that this can now be released is to prise the lock mechanism apart to release the internal mechanism. This can normally be done by using a screwdriver down the side of the lock, at the area you can see the lever enter, by then turning the screwdriver the lock can normally be separated, splitting it apart and releasing the catch. This will then need new lock fitting.

You have not mentioned how much damage you have done to the door card, but as you have already cut it, then I would expect that further damage would not be too much of a concern and you will be considering replacing it with a second-hand unit.

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AUDI A3

Oil consumption

Q My daughter recently bought a 2011 Audi A3 1.8 TFSI Sport with 65,000 miles on the clock. Although it is a good runner, the oil consumption seems to be excessive, sometimes up to one-and-a-half litres every two weeks, covering 50-60 miles. There are no oil leaks or blue smoke from the exhaust and the car has no history of past problems. Is this a common fault with this engine or is there a problem? Also, is this engine belt- or chain-driven?

J Smith

A The engine code of your daughter's Audi should be CDAA and it is chain-driven.

Unfortunately, the TFSI engine is renowned for its oil usage and some owners were fortunate enough to have the issue rectified under the Audi warranty. However, the consumption in your daughter's Audi is excessive even by Audi's allowed usage of a ½ litre per 1000 kilometres (around 620 miles).

If your daughter bought her A3 from a dealer, she should have some recourse as the Consumer Rights Act 2015 tightened up on used vehicle sales. See the money advice service website (http://bit.ly/2Cmpcps) for full details of her rights, or contact the AA or Citizens Advice Bureau. If she has owned the car for more than 30 days, she is still entitled to ask for a repair to be carried out. During the first six months of ownership, it's the responsibility of the seller to prove the fault wasn't there, not for your daughter to prove that it was. After the first six months, this changes and your daughter would have to prove that the fault was present from the day she bought the vehicle.

If the seller is unable to repair or replace the Audi, your daughter will be entitled to a refund. However, the dealer can make a deduction from the purchase price to cover fair wear-and-tear and usage.

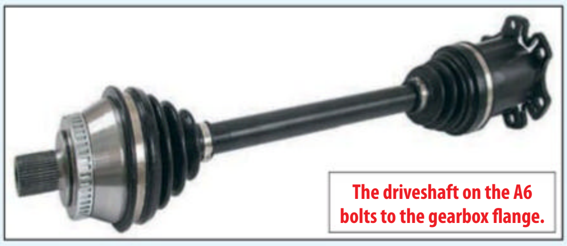
AUDI A6

Harsh transmission

Q My 2003 Audi A6 Avant TDI Multitronic has some 193,000 miles on it and is generally pleasant and easy to drive or be in. The problem I am having is with a harshness in the transmission that shows after about an hour's running and then only on uphill terrain and above 60mph, mostly on motorways. This issue seems to have only become noticeable after both driveshafts were renewed at the last MOT, by my local garage. My query is, are the driveshaft specifications different for A6's with Mutitronic gearboxes? If so, what are the part numbers?

Thank you in anticipation of your reply.

Bill Tingle



The driveshaft on the A6 bolts to the gearbox flange.

A The driveshafts on your Audi bolt onto the gearbox flanges and from the details I have, the driveshafts on your Mutitronic CVT transmission should be one of three part numbers, all of which have the same dimensions. The part numbers are 4B0407271AS, 4B0407271BB and 4B0407451PX

The shafts are 544mm in length and the diameter of the shaft is 124mm. The ABS ring on the shaft should have 45 teeth.

As the driveshaft replacement does not involve the draining of the gearbox, then any problem associated with the driveshafts could only be an external problem, with the possible location on the shaft onto the flange.

It is quite common to find that the shaft to flange bolts do loosen off over time, and this is something I have come across quite regularly. For this reason I would recommend checking the tightness of the bolts to ensure that this is not occurring. The torque setting for the M8 bolts is: 40Nm and for the M10 bolts is 70Nm.

The transmission oil on your Audi should be replaced every 40,000 miles and if this has not been done recently, then I would advise that this be carried out.

AUDI A6

Oil seal

Q I have a 2007 Audi A6 2.7 TDI, and I have to change the oil seal behind the pulley on the cylinder-head which powers the belt for the fuel pump. I can't find the bolt torque setting for it anywhere. Can you help? Many thanks.

Mark Deane

A Whilst the VAG ESIS system clearly specifies a torque setting for the camshaft chain driven sprockets (5Nm for the left sprocket and 45Nm for the right sprocket), I could at first see no torque specification for the pulley that drives the fuel pump belt.

The manual clearly goes through the process to replace the oil seal and simply ends the process with the wording – "The installation is carried out in reverse order".

I did however find the torque setting hidden away in the section on the fuel pump, and the torques setting for the camshaft bolt is 75Nm. I can also add that the torque setting for the tensioner bolt is 23Nm, and if needed the torque setting for the belt cover bolts is 9Nm.

AUDI TT

Headlamp brightness

Q My wife has a 2009 MkII Audi TT (pre-facelift), and the dipped beam headlights are quite simply appalling. The main beams are about the same as my 2007 Octavia vRS, but on an unlit road, if you have to use dipped, you can hardly see a thing.

She's tried the upgraded bulbs, with no improvement, and while there's some crazing in the headlight covers, there doesn't seem enough to cause big issues (and to me, if that was the problem, then the mains would also be a lot worse than mine).

We've started considering some replacement units, but starting at about £400, that's not a cheap solution – with, of course, no guarantee that they'll be much or indeed any better!

I'm also assuming that the alignment can't be too far out, otherwise it wouldn't be passing the MOT.

Any suggestions you could give for diagnosis, or even suitable replacement units, would be greatly appreciated. If you think it would be useful, we could get

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AUDI A6

Gear selection issue

Q I recently bought a 2008 Audi A6 2.0 TDI 140bhp auto 7-speed with 115,000 miles privately. I had a lot of work done with my mechanic – all fluids and filters changed, timing belt kit and water pump change, oil pump balance shaft and pencil drive changed.

After I bought the A6 the gear selector in the gauges kept flashing so my mechanic cleared the codes for clutch slip. Two weeks after repairs I was going down a steep hill it seemed to struggle on which gear to select as revs were high. Next day the same situation but now it wouldn't change gear with the selector flashing. I turned the ignition off and back on again and it drove fine going back home but with the selector still flashing (I haven't driven it since). The gearbox was refurbished by the previous owner at a cost of €2200 at a gearbox specialist, it still has six months warranty left. If there is an ECU for the gearbox I do not think it's covered. The turbo was also refurbished but no receipt.

The same week I noticed it had been using coolant and dropped to below minimum after about 250 miles with no obvious leaks – my mechanic is hoping to fix the coolant issue first. It also has been very smoky mainly on idle (white smoke with I think an oily smell) since the service. Could this be the result of the coolant loss?

I need advice on the autobox as I'm not sure if both faults are linked and I want to have some info so that the autobox specialist doesn't try to brush me off. I have some knowledge on cars but this is a bit more complicated and I'm trying to find at home the magazine issue on DSG specialist that I've read before.

I was with the gearbox specialist a couple of weeks ago as car whines (or like gears at high revs), at idle, when revving and gets a bit louder as you go and pick up speed going through the gears until you're at cruising speed and its fine then, but as soon as you hit the accelerator to overtake, you hear it again. Also you'd hear it more when urban driving. It sounds like the old buses going through the gears. He said whine isn't a gearbox issue by his test which involved car in Park mode and trying slightly to stall the engine which disengages the box and noise was still there. He was 99.9% sure!

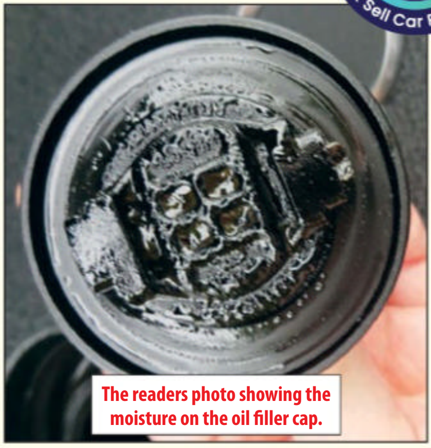
My mechanic and I both agreed the turbo was refurbished due to its condition, new looking with new bolts etc., so I don't think it's that.

My mechanic also thought the coolant leak was because the EGR cooler internals failed so he temporarily bypassed the cooling pipes and it is still leaking. I'm due to drop the car back to him as well. For smoky issues I have put in Diptane fuel additive (what would you recommend?) and will be putting it in again in the next full tank as it hasn't solved the issue yet. Attached is a photo of the oil cap. This was cleaned about 30 miles ago and this is how it looks. It's not really oily to touch but looks more like moisture?

As regards the gearbox specialist, I know even though it is under warranty the last thing he will want to do is strip it all down again. So, it would be good to have some information to show that I have some knowledge to debate with him. Unfortunately, he is 70 miles away.

Hoping to get the coolant leak fixed first and then go to the gearbox specialist.

Denis Jordan



The readers photo showing the moisture on the oil filler cap.

A The magazine feature on the DSG Mechatronics was in the December 2019 issue. Starting with the cooling issue, I would not expect this to be connected to the gearbox problem. As the EGR cooler has been bypassed, this will eliminate that as being a possible cause, and it would be wise to have a coolant system pressure check carried out. Having already had the water pump replaced this can hopefully be discarded as a cause of the problem. There is a possibility that the smoking issue and the moisture on the oil filler cap are both related to the coolant loss, which may possibly be a head gasket issue. There would need to be more tests carried out to determine this and I would rather not jump to conclusions without a more thorough investigation taking place.

The Diptane fuel additive is designed to burn the carbon more completely from the system, thus preventing the DPF regeneration process from being needed so often. It does have good user reviews and so would seem to be a good additive to use.

The DQ200 gearbox in your Audi is a 7-speed dual-clutch unit which has a dry clutch assembly unlike the earlier six-speed gearbox which ran the clutches in oil. There was a problem with the DQ200 gearbox which resulted in the electronics in the electronic control unit shorting out due to humidity build up. The symptoms of this problem were shuddering and loss of power, and extreme cases loss of drive. Similar symptoms could also be the result of a number of faults within the Mechatronic system.

It may be this problem with the control unit which has caused your gear selection problems. I would also be concerned that the noise on idle may be related to a bearing in the clutch hub of the gearbox, unlike a conventional gearbox where the drive can be disconnected by dipping the clutch. The DQ200 gearbox input from the engine drives the clutch hub, this is turning constantly and cannot be disconnected from the drive. If the bearing on this hub is faulty, this would give you the constant whine you describe.

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some photos of mine *vs* hers on an unlit road. Thanks.

Craig McWiggan

A The main beam and the dipped beam bulbs and lens are separate on the Audi TT and so the two different units could give a different output. If the lens is cloudy then it can be the case that the different projection of the main and dipped beams could benefit from the headlamp lens being cleaned, and it may be worth attempting this as a first step, It is surprising how much difference this may make.

You have already tried different bulbs and as you have discovered the brightness of the street legal bulbs does often not improve the situation.

One option may be to upgrade the headlamps using a kit from this company https://bit.ly/CML45Pb although not having used this company this is only a suggestion and not a recommendation.

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SEAT IBIZA

Stereo stays on

Q Can you advise me on an apparently common wiring fault with my 2000 SEAT Ibiza Vibe 1.4. When I take the key out of the ignition, the stereo stays on and the display flickers. If the stereo fuse is left in, the battery drains down and becomes flat. What is the cheapest way of fixing this problem? Could I put a switch in the power line?

R Caruth

A The accessory position from the ignition switch is not only controlled by the rotary action of the switch, but can also sense when the ignition key is still in the ignition, allowing the accessories to remain live. Often this mechanism sticks when the key is removed, allowing the accessory connections to remain live.

The first step would be to use a switch cleaning spray directed into the ignition lock to free-off the mechanism. By operating the lock and removing and replacing the key in the ignition, see if the radio will then switch off as the key is removed.

The problem could also be with the operating mechanism itself. If this is the case, the ignition/steering lock will need to be replaced. A cheaper option would be to place a small toggle switch in the accessory circuit, which comes from the terminal number 15 on the ignition switch. There are two possible layouts to your ignition switch depending if you have the five- or eight-terminal switch.

At the very least, if you remember to turn off the radio before removing the ignition key, this should stop the radio from draining the battery.

SEAT LEON

Glow plug

Q Hope you can help? Approximately a year and a half ago the No.2 glow plug on my 2014 SEAT Leon 1.6 TDI, gave an error message so I replaced the glow plug. At the time I purchased a Bosch glow plug and a genuine SEAT plug online, as the SEAT one arrived first I fitted that one. The Bosch one appeared to be identical.

Last week the No.2 glow plug – again through code P0672 – so I fitted the Bosch glow plug. All was well for two days before the EML light came back on, with the same code. I reset the code which has lasted another two days (mobile phone-based code reader).

Do you know of any known issues with these plugs? I do wonder if the connection to the plug is not as sound as it should be so will check that. Perhaps I need to change all the plugs just in case?

Any advice will be gratefully received.

Dave Fox

A The code P0672 refers to the glow plug circuit on number 2 cylinder and whilst this may be due to a failed glow plug, it is also highly likely the code has been flagged up due to a poor circuit in the wiring, or the relay.

I would start by checking the connections on the glow plug control module which is located in the engine bay fusebox between the battery and the nearside inner wing. Check for any corrosion on the plug. If this looks clean, then using a continuity meter to check the wiring between the glow-plug control module and the glow plugs, may reveal a problem.

Autodata also mention that a common problem can occur on your model of SEAT, due to a poor connection between the engine bay fusebox and the relay plate, so this is an area to check.

From the details I have, the colour code of the wire to No.2 glow-plug should be Black/Blue.

The glow plug for the SEAT Leon.

SEAT ARONA

Timing belt

Q Can you confirm the timing belt replacement period for my 2020 SEAT Arona 1.0 TSI is 15 years or 180,000 miles?

Ray Stockwell

A The timing belt replacement interval for your SEAT Arona engine code CHZL is every 200,000 miles or 180 months. The job time is given as 3.4 hours. There is also a separate water pump drive belt, and this should be replaced if the water pump is renewed.

SEAT LEON

Light rattle

Q I have a 2015 SEAT Leon 1157cc. After the engine is fully warmed up (at least a 4-mile trip) and is then switched off and let sit for about 15 mins, and then started again, there is a light rattle sound lasting for only a few seconds.

The car drives perfectly, and this is the only time I hear this sound, and I don't hear it when starting from cold. Could this be a hydraulic mechanism requiring oil pressure to build up, e.g. tappet operation?

When I mentioned this to a mechanic, the reply was "don't worry they all do it"! My son buys this magazine every month and passes it on to me, as he says I have spent half my life on motor DIY, maybe it's time to retire!

I would appreciate you sharing your expertise and knowledge on this possibly trivial noise. Many thanks.

Samuel J L Bell

A The engine in your SEAT Leon does have hydraulic cam followers, and the rattle you describe is that which may be experienced under the conditions that you describe with a warm engine.

The oil when warm will be that much thinner and this will not only allow the followers to drain slightly, but the warmer thinner oil may also take a second longer to fully fill the oil gallery to fully supply the hydraulic lifters, and so I would be happy that the noise you can hear is simply a result of the thinner oil under the starting conditions.

As there is no noise when starting from cold, this does not point towards an oil pressure problem or engine wear condition that would be a concern, and I would be happy that this is, as the mechanic mentioned, a normal condition.

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SKODA YETI

Oil dilution

Q I have a Yeti CR Ambit 81/2.0 5MG Diesel, registered 8th Dec 2010, engine number CFHA which has covered 78k miles. My problem is that about 500ml of diesel is finding its way into the engine oil every 1000 miles. It's mostly used for short trips, but has a 40-mile run every weekend, albeit on A-roads with a lot of 50 and 30mph limits.

The engine has no fault codes on any fuel or engine system (there is only 1 on the car for climate control) and the DPF light on the dash is not illuminated. You have to remove the EGR pipe to change the oil filter, and it's really clean.

It starts easily, drives well, with good power delivery and no black smoke. Engine seems to idle a little fast for a diesel at 750rpm.

I will be very grateful for any advice you can give what the problem might be.
Matthew Hunt

A As your vehicle is driving well and has no fault codes, the most likely reason for the diesel entering the sump is due to the short journeys you often cover. The DPF regeneration system on your Skoda Yeti operates by injecting fuel into the engine on the exhaust stroke, this then should enter the DPF and assist the regeneration process.

When the conditions for the regeneration are not fulfilled the process is abandoned and another attempt is made the next time the engine reaches a suitable temperature.

Each attempt will allow a small amount of fuel to enter the sump and the manufacturers do allow for this in the design of the engine. It is recommended that the oil level is regularly checked as due to failed regeneration the oil level may rise and the oil can become diluted.

The manufacturer does recommend that if this occurs it is advisable to change the engine oil before the normal recommended mileage, to prevent the diluted oil from allowing wear to occur in the engine.

The problem with the modern diesel engine is that the emissions related improvements do require that the vehicle is used for longer faster runs, this means that the modern diesel engine is not ideally suited to short journeys or town work, as under these conditions the engine does not reach the required parameters to allow the regeneration to take place, allowing oil dilution over time, and possibly the clogging of the DPF.

SKODA RAPID

Oil extraction

Q Please can you tell me how to extract the engine oil from my 2017 Skoda Rapid Sport 1.0. I normally use an extractor pump via the dipstick hole, but the pump I have doesn't fit down the hole.

Do I need a new extractor (the old one is around 20-years-old) or do I have the remove the drain plug?
Dave Kelsey

A From the details I have, many of the older syphon pumps had a tube of around 9mm, but one which is under 6mm would be needed for your Skoda. It may be possible to purchase a new tube to insert into the dipstick tube, and it may be worth contacting the maker of your present unit. They could then advise you of a replacement that may be available.

Alternatively, draining the oil from the sump would be an ideal method of ensuring the oil is fully drained. The sump plug seal would need to be replaced and the torque setting when resecuring the sump plug is 30Nm.

A modern oil extraction tool for drawing the oil up through the dipstick.

SKODA OCTAVIA

Tracking

Q My son has a 2014 Skoda Octavia and went into an ice skid on a roundabout and hit the kerb whilst turning the wheel to the right to control the car. It hit the kerb and had the following lamps come on; Error Stabilisation Control, tyre pressure loss indicator, Stop-Start error and icy road warning.

Driving the vehicle it pulled to left requiring oversteering to the right. I told him to get to a garage and get it checked as tracking was definitely affected and the wheel may have been damaged.

The tyre centre checked the car tracking and the report is attached. He was told that the tyre was OK and wheel did not require rebalance although if it vibrated at 70 the wheel may be damaged. He also suggested that the hub could be bent. They reset the Steering Angle Sensor and tyre pressure light.

Looking at the results, the geometry still looks out and he did not mention the nearside rear wheel which also looks out.

My thoughts are that something was bent on impact and the car needs to be brought back to standard from a safety perspective.

Do you agree with me that the suspension still needs attention? I would initially look for a bent track rod, steering rack mounts and control arm initially, but would appreciate any suggestions on other areas to be checked.
David Roberts

A I am afraid the image you sent was slightly blurred which made it difficult for me to make out the tracking, camber and caster readings. But what is clear are the red areas which do indicate that the settings are not within tolerance. It would appear that the tracking has been corrected but the camber has not. This would suggest that the lower arm may have been bent in the collision and this would explain why the reading is still out.

Although the Skoda may drive well and the correction of the tracking may be enough to ensure that the parameters of the steering angle sensor are met, the tyre may wear unevenly due to the incorrect camber angle.

I would certainly agree with you that the suspension needs attention and would suggest that it may be better looked at by a repair workshop rather than a tyre centre, who I am sure have done an excellent job of correcting the tracking, but may be less skilled in the care of the suspension, and it seems may be short of time to look at the problem.

My concern is that he was told if the wheel vibrates at 70 it may be damaged, when removing it and balancing it would have shown up any defects and settled the matter.

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VOLKSWAGEN TOUAREG

Rear brake disc & pad change

Q I am intending to carry out rear disc and pad replacement on a 2014 VW Touareg (7P). I consider myself to be fairly proficient and have a full workshop at home with a hydraulic ramp and VCDS. I have done much research on the vehicle and have picked up varying procedures, one of which worries me. The main worry is the grinding-in of the brake shoes when the discs or shoes are changed.

The rear set-up is caliper pads for braking and brake shoes for the electronic handbrake which acts on the inside of the disc. Normally I would use VCDS to retract the shoes so that the disc can be removed. However, to do so would mean that I would have to go into module 53 of VCDS, go to 'output settings' and retract the shoes. I am told that when I do this the vehicle goes into fault mode and the shoes will need to ground in to the discs over a period of a few hundred metres, using VCDS to manage the process.

Now I am aware that there is also a setting whereby there needs to be an air gap between the shoes and the disc (1.8mm to 2.4mm). This can be adjusted manually and measured by VCDS. Given that this air gap exists, is it possible not to contract the shoes and just remove the old discs, replace them, and then reassemble the calipers with new pads. This will hopefully mean that I don't need to go through the grinding process. Your thoughts would be appreciated.

Shabaz

A If you didn't have the VCDS I would suggest you release the parking brake and, ensuring the ignition isn't touched, slacken off the adjusters on the parking brake shoes before replacing the brake discs and adjusting the parking brake shoes back up. As you are not replacing the parking brake shoes, the process would not take long. The parking brake could then be cycled, and I would not expect any problems using this process.

But as you do have the VCDS and have the capability to carry out the job using the equipment, you may wish to follow the full process. This does though require an empty road or an area of least 500 meters for the process to be safely carried out.

The process is as follows:

- **On the VCDS select 'control module', then select '53 – parking brake'. Go to 'Avd.meas. Values' and select 1, 2, 3, 4. The air gaps should be 2.0-2.5mm and within 0.2mm of each other.**
- **Having checked and recorded the pre-operation settings – the parking brake should be operated on and off. Then using the VCDS, select 'output tests-03' and go to 'open caliper'.**

This will, as you suspect, bring up an error while the caliper is open. The brake discs can now be changed and adjusted setting the gap between the brake shoe and drum area of the disc.

Once this is done go back into VCDS and select close calipers, then select 'done' and go back to the 'Avd.meas. Values' and select 1, 2, 3, 4 air gap left and right, and air gap before calibration left, right. The settings after calibration should now have a reading. Hopefully the after setting, the gap should be close to the desired setting.

Now on the same screen select items 19, 20 'grinding in status' and 'remaining grinding in time'. Now select 'done' and return to the previous screen. Turn the ignition off then on again, and apply and realise the parking brake, twice. Now

---

VOLKSWAGEN GOLF

Cruise control

Q I have recently acquired a 2014 VW Golf Mk7 1.6 TDI and overall, very pleased with it. My only problem is that the Cruise Control (CC), and Adaptive Cruise Control (ACC) do not work. When pressing the CC buttons nothing happens, no 'Green' CC indicator on instrument display at all. I am not particularly worried about the ACC but normal Cruise Control is something I regularly use on any car. I assume the two systems are linked so a fault in one will disable the other.

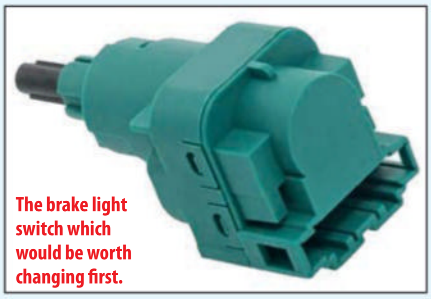
The owner's handbook is unnecessarily complicated in describing system operation and does not give any clues on fault finding – other than go to VW?

Haynes manual 6416, does not describe a fuse for the CC but does mention 'Fuse 32' (rated 10A) as including ACC together with other systems? The internet 'experts' seem to question this info and one mentioned Fuse 5 (rated 5A) which Haynes describe as Data bus diagnostic interface.

I don't have any spare fuses yet and thought it prudent to ask for your input before interfering with the electrics.

Thank you for your help.

Keith King



The brake light switch which would be worth changing first.

A Let me start by saying that the owner's handbook is a very underread and undervalued publication. More owners should get to grips with their vehicle by reading the information supplied.

The only fuse I have listed as having a connection to the cruise control is fuse number 32 (10A) in the interior fusebox – this does concur with the information you have from the Haynes manual.

Fuse number 5 on your vehicle according to the information I have is for the engine management and so I would not expect this to be the issue.

I would start by checking the fuse number 32 as indicated, but if this proves to be OK then it may be the case that a diagnostic scanner will be required to detect the issue. The cruise control will be disabled if any other issue is present, and this can be as simple as a brake pedal position switch, or as complex as a cruise control module failure.

I would add that even though the brake lights may be operating correctly, the brake light switch is a four-wire unit and the circuit that control the lights is separate from the management circuit, and so this may still be the issue even if the brake lights do appear to be working.

If you do not have the required diagnostic equipment and you are confident enough to replace the brake light switch, this may well be worth trying before paying out for a diagnostic test, as this is a common issue.

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select 'output tests-03' on the VCDS and then 'break in'.

The vehicle should be then started up and running. With your foot on the brake, engage D then select 'start', and begin to drive the vehicle at around 7mph. The brakes will drag and once the brake releases you can stop. The brakes should then be allowed to rest for a few seconds before repeating the process until the required distance is covered. This will be shown by a countdown in the display on the VCDS.

Once the distance has been covered, 19 will display 'grinding in sufficient' and 20 will display '0'. With the vehicle then in Park, select 'done' and go back on the VCDS screen.

With the grinding-in process completed, go back on the screen and select '04-basic setting', then select 'air gap calibration'. Hit 'go' and the calibration should begin. Now the fault codes can be cleared.

The other option, and one which I would follow, would be to miss out the grinding-in process and – once the brake discs are refitted – follow the instructions for the calibration process. Go to 'recalibrate' and clear the fault codes. As you are not fitting new shoes, I believe this would be perfectly acceptable.

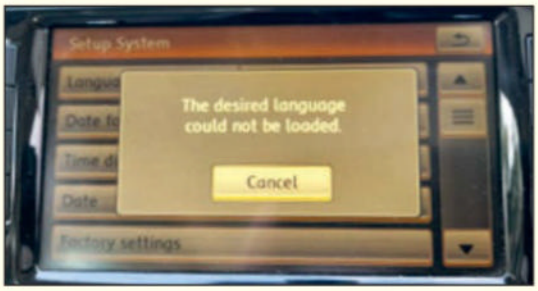
VOLKSWAGEN TIGUAN

Language display

Q As an avid reader of *Car Mechanics* I would ask your help with my father's 2010 Tiguan R line. The current language display for the central console is stuck in Dutch/German. The vehicle recently had a draining battery issue and had to be jumped-started a few times prior to the replacement of the battery and it was in the period of a weak/poor battery the display changed language.

Given my father is on in years, he's not going to learn a new language and I would ask for your help in changing back to English. We have, as you see from the photo, tried the normal procedure for selecting English but it indicates "The desired language could not be loaded". Any assistance in resolving this dilemma would be greatly appreciated.

Pat Hunt



The desired language could not be loaded.

A **As you have been able to negotiate the menu and the current message is written in English, I suspect that the software may be corrupt. If this is the case, then it may need replacing but it could be possible to reset it using dealer-level equipment.**

One other cheaper option to try first would be to drain the capacitive memory of the system in order to allow it to fully reset. This may have been affected during one of the jump-start situations.To do this ensure the ignition is switched off and turn off and disconnect both battery terminals. Then place the two disconnected terminals together for around 30 seconds.

The battery can then be reconnected. Once the battery is reconnected switch on the ignition and wait for 30 seconds before switching the ignition off again. Then switch on the ignition and start the engine as normal. Automatic windows may need resetting, but the engine functions should be relearnt during the next driving cycle.

The windows can be reset as follows:

- **Switch on the ignition ensuring all doors and windows are fully closed. Then lift and hold the window close switch for at least one second, release the switch then again lift and hold it in the close position for one second.**
- **System should now operate correctly. This will need to be repeated on each automatically operating window, the ignition can then be turned off.**

After carrying this out it may be possible to reset the display language, or it may even boot up in the correct language. If this is not the case, then the next step would be to use dealer-level equipment in an attempt to rectify the problem.

VOLKSWAGEN GOLF PLUS

Brake bleeding

Q My daughter had a 55-plate VW Golf Plus from 2011 until last year, during that time it had three ABS units (two under warranty) – and also rear brake caliper problems and I had terrible trouble getting a decent brake. I tried pressure bleeding and the vacuum tool that you suggested as well as the two-person method.

I discovered that the air gets trapped in the handbrake part of the rear calipers and the way to get it out is to take off a rear caliper, wind back the piston and keeping the wind back tool in the caliper, hold the caliper with the tool upwards and bleed it. Any trapped air will rise and can be bled out, then refit and do the other side. It doesn't matter which method is used for bleeding.

I also have a couple of questions – firstly why do all the motor part suppliers list synthetic brake fluid? I look after a 2007 petrol Qashqai, a 2007 diesel Kangoo, and a 63-plate diesel Sportage – all listing DOT 4 and a 63-plate petrol B-MAX listing Super DOT 4. Yet all the suppliers insist they should have Synthetic DOT 4. What do you think and are there any advantages to using synthetic?

Also, what engine oil should I put in the 63-plate 1.7 diesel Sportage?

One last comment, I have on your recommendation bought a Foxwell NT680 and have used it successfully several times. Twice when using it on the B-MAX it has flattened the battery, the battery had not shown any other problems although it is eight-years-old and so I replaced it. I can thoroughly recommend www.batterygroup.co.uk – a very good price and next day delivery. This was the second battery I have bought from them.

Bob Gumbrell

A **Other than LHM mineral oil, which is used in some braking systems, the standard DOT categorised fluids, 3, 4, 4+ and 5.1 are all synthetic and made from a chemical mixture of glycol ether/borate ester. DOT 5 is Silicone-based.**

Brake fluid has not been a natural oil based substance since the days of DOT 2 fluid which was castor oil and alcohol, but the word Synthetic appears to have been added in later years, and this may be to make the fluid more desirable, or give the appearance of a more advanced formula, or perhaps just a sales ploy to enable a price increase, but technically speaking, it is no different from the fluids not marked Synthetic.

The oil recommendation I have for the 2013 Kia Sportage 1.7 CRDi is a 5W-30 oil conforming to the ACEA standard C3 – this should be a low ash oil. The capacity of the sump is 5.3 litres.

As with all diagnostic equipment, prolonged use can be a drain on the battery, and at eight-years-old, is a good length of service for a modern battery.

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VOLKSWAGEN GOLF

Gearbox selection

Q I cannot get reverse gear in my 2000 VW Golf MkIV 1.8 GTI with the AUM engine. The car is in excellent condition, well serviced and all forward gears work perfectly. Two years ago, the same thing happened and I took it to a garage, which suggested sending the gearbox to a specialist company. While removing the gearbox, they don't know what happened but they suddenly discovered reverse gear was going in, so no further work was carried out. Everything went fine until about two months ago, when the same thing happened again. I eventually managed to get it in reverse, after which it has been failing intermittently.

Now, nothing will help in engaging reverse. It makes no difference if the engine is running or not. Before I consult a garage, I feel that if the fault is in the gearbox itself it wouldn't have worked nearly two years before failing again. I suspect it's something to do with the linkage, although they are all clean and well oiled. All other aspects of the gearbox are fine, and the gearbox oil was changed just three years ago.

William Atherton

A First, I would try to establish if the problem is due to a fault at the gearstick end of the selection mechanism or the gearbox end. You may be able to confirm this by disconnecting the cables. The problem may also be due to a misadjustment, but if this were the case I would have expected a more consistent problem, not the intermittent one you are experiencing.

I have come across a few problems with the gearchange mechanisms on the Golf and sometimes this can be a very simple fix. I once discovered that the reason for the non-selection of gears was due to one of the gear selector mechanism turret bolts becoming loose and jamming the mechanism.

Being a 2000 model, your car should have the later gearchange mechanism. This is set using a pin (part no T10027) at the gearstick end of the mechanism, and the built-in locking pin in the gearbox selector mechanism. By removing the air filter housing, you will have better access to the selector mechanism on the top of the gearbox. First ensure that the top bolts holding the selector mechanism into the gearbox are tight – if one comes undone by a few threads it will jam the mechanism. If the bolts are tight and not causing an obstruction, I would then inspect the components of the external mechanism for signs of wear. A shiny mark may give a clue to any tightness in the mechanism. If you can find no play in the shaft or any apparent problem with the mechanism, I would then grease the external components on the mechanism to ensure that friction is not occurring and causing the mechanism to drag.

As the problem has only ever been experienced when selecting reverse, I am not sure that the fault would be in the selector turret, but could be an internal issue with the reverse gear selector fork. This would require the gearbox to be removed and stripped down in order to rectify it. However, given that the problem was suddenly and inexplicably remedied when it was being removed, I am hopeful you will find an external reason.

VOLKSWAGEN GOLF

Electrical problems

Q While driving my 2002 VW Golf MkIV TDI, the battery warning light came on, along with the alternator workshop message. At the same time, the radio turned off and then on, and the climatronic display flashed on and off, as did the headlights. After a couple of minutes, it all settled down and the warnings went off. This has happened three times in the last week. The battery is only six months old and seems fully charged, although I haven't checked the voltage. No fault codes are logged.

Mike Boswell

A I would first check the battery connections to ensure that the problem isn't simply a poor connection. If the terminals on the battery are clean and firmly fitted, you should then check the earth connections from the battery to body and engine to body. Using an ohmmeter to test the resistance in the circuit may help illuminate a poor connection.

If there are no problems with the connections to the battery or earth straps, turn your attention to the fusebox. First check the small fusebox on the top of the battery, inspecting the connections to the cables and the fuses. You should undo the small 10mm nuts clamping down the fuses and check the condition of the fuse. These small fuses can develop a tiny crack which is not always visible on first inspection.

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Kit contents:

- The kit includes 19 injector adaptors to cover Bosch, Delphi, Denso, and Siemens diesel injectors, ensuring compatibility with a wide range of models.
- Male adaptor sizes include M8 x 1.0, M8 x 1.25, and M10 x 1.5. Internal adaptors range from M17 x 1.0 to M31 x 0.75, providing extensive coverage for various injector types.
- Additionally, a M18 x 1.5 - 5/8" UNF adaptor, allowing all adaptors to be connected to slide hammers with M18 threads or 5/8" threaded devices.

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Diagnostics Doctor

Steve Rothwell answering your **ENGINE MANAGEMENT** queries

GENERAL

ABS code reader

Diagnose
LAUNCH

The Launch CRP 123 EVO which would be a good diagnostics machine.

Q What would be a good diagnostic machine to buy for reading ABS sensors?
Stuart Anderson

A **The reading of ABS codes is normally incorporated into a machine which will also read engine codes, transmission and SRS systems. The Launch CRP 123 EVO will cover the ABS system on most vehicles along with also reading codes from the engine, Transmission, and SRS diagnosis. It is also capable of reading/clearing diagnostic trouble codes and displaying the live data streams.**

The reading of live data is an important function as this is a useful tool in the diagnosis of problems. The tool is currently £222 inc VAT and available direct from www.launchtech.co.uk

BMW 1-SERIES

Battery coding

Q I'm looking for a reasonably priced scan tool to do battery registering on my 2014 BMW 1-Series 1.6d F20. Could you advise on this please and is battery resetting the same as battery registering?
John Shiels

A **The new battery needs to be registered into the power management system in your BMW. This can be termed as resetting and so either term resetting or registering can be used. The programming into the power management system of the battery, can only be done using diagnostic equipment.**

For your BMW there are a few options. Foxwell NT530+ Full Systems Scan Tool - BMW & MINI which is £164 from Gendan.co.uk and is probably the best reasonably priced option. This also has lifetime updates.

There are also a number of App-based systems that use the power of a smartphone with the coupling of a Bluetooth device connected to the vehicle's diagnostic socket.

If you did want to go for a more expensive tool then the Launch X-431 Euro MOT IV will cover all your needs for £954 direct from www.launchtech.co.uk – this unit comes with two years' worth of updates.

CHEVROLET TRAX

Rough running

The suction control valve that has been changed on this Chevrolet Trax.

Q I've a problem with my wife's 2013 Chevrolet Trax (Mokka) 1.7 diesel auto with A17DTS engine. I have been a home DIY mechanic with the help of *CM* for the past 55 years, but this Trax is a bit baffling. It started running rough and idling rough sometimes going into limp-mode with no codes showing. I contacted a local mobile diagnostics guy who said it was the suction control valve in the pump, and so I bought a Denso valve off eBay, and all was OK for a while.

Seven or eight weeks later same again, same diagnosis. I bought another valve and same again lasted a few weeks. Diagnostic guy convinced these valves are not genuine Denso or incorrect items, suggested a genuine dealer part.

Vauxhall didn't want to know – haven't got the catalogues for Chevrolet. I found a dealer in Sunderland who deals in Chevrolet parts and got one off them. The diagnostic guy set it up and it's been OK for the last eight weeks but I'm not holding my breath!

Is there something that could be killing these valves? I have changed the fuel filter twice in the last six months just to be sure. I thought I'd ask you if you knew of anything that could cause the failure of these valves. Its running OK at the moment but I would like to be one step ahead if it happens again. Thank you.
Alan Sturt

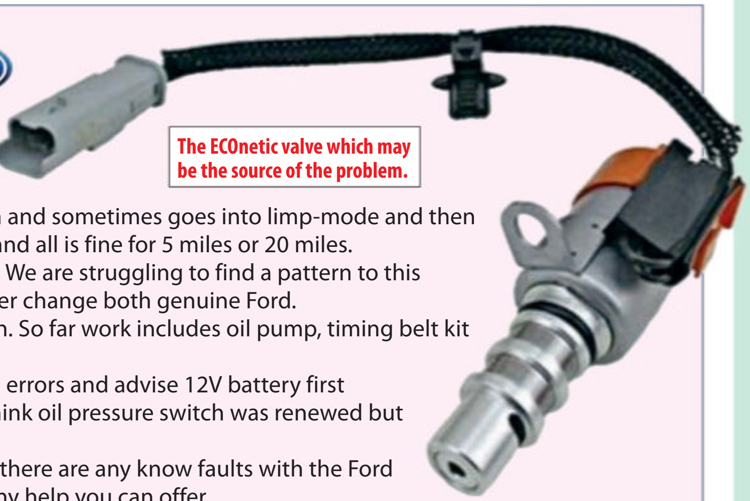
A **Without a code it is difficult to know the exact situation that was occurring, and it is possible that the suction control valve is the problem and hopefully with a new genuine valve this will rectify the problems. If the problem does return, then there are a few avenues I would explore. The first would be to ensure that the fuel filter has been renewed, and that it is clean – and no debris is gathering in the filter. If there are signs in the filter of contamination it may be the situation that this is causing the premature failure of the valve, and the source of the contamination should be investigated.**

If the filter is clean and the possibility of fuel contamination can be eliminated, then I would consider checking the MAF sensor as it may be a correlation between the perceived air input and the adjustment of the fuel via the suction control valve that is causing the poor running.

I have seen many MAF sensors fail without giving a fault code. It may be possible to clean the MAF using a dedicated cleaner or by using isopropyl alcohol and if doing this it is important to note that the MAF sensor must be perfectly dry before then starting the engine.

FORD MONDEO

Cutting out



The ECOnetic valve which may be the source of the problem.

Q We have an April 2016 Mondeo with I believe the PSA/Citroën engine. Could you help to diagnose the fault for me please? The car will just cut-out with oil light coming on and sometimes goes into limp-mode and then cuts-out – you must wait between 5 and 30 mins before it restarts, and all is fine for 5 miles or 20 miles.

Next day the car can do up to 200 miles and then start to cut-out. We are struggling to find a pattern to this problem. The biggest difference was an oil change and later fuel filter change both genuine Ford.

Car seems to run rough just before the oil pressure light comes on. So far work includes oil pump, timing belt kit and water pump done at same time.

Ford agent found multiple DTCs stored including communication errors and advise 12V battery first (failed test). All OK afterwards and no-fault codes returned. Also, I think oil pressure switch was renewed but cannot be sure.

This saga has been going on for over 12 months. Could you tell if there are any know faults with the Ford version of this engine – the current mileage is 114,000. Thanks for any help you can offer.

Paul Davies

A The engine in the Mondeo is the 1.5 diesel engine which was developed jointly with PSA, although a slightly different 1.6 version was used in the Peugeot/Citroën vehicles. The concern I have is with the oil light coming on, and this may suggest that the ECOnetic oil pressure control valve may be at fault.

If it were not for the oil pressure warning and the fact that the oil change did make an improvement to the situation, I would have advised that a new crankshaft sensor would be a good option. This would be affected by the heat, and it is possible that the symptoms described could be attributed to a faulty crankshaft sensor.

However, the oil pressure light coming on does lead to me believe that this situation is certainly connected with an oil pressure issue. Having already replaced the oil pump and changed the oil and filter with a slight improvement I would, for this reason replace the camshaft actuator (ECOnetic valve) as this could allow the oil pressure to drop if the valve was incorrectly operating.

This could give the symptom you have of the cutting out as the cam timing was altered and would allow the oil pressure light to come on.

HYUNDAI i20

Lumpy running

The knock sensor on the Hyundai that may not be operating correctly.

Q As if I didn't have enough headaches with my own Skoda Fabia, my sister's 2009 Hyundai i20 1.2 is also misbehaving. Occasionally it will start running lumpy and throw up codes from multiple misfires and specific codes relating to misfires in cylinders 2 and 4.

It doesn't happen often, but what is very prevalent is 'pinking' when accelerating or going uphill, although if given enough time at a constant rpm, it stops.

I got my mum to watch the live data on my Foxwell NT644 Pro whilst I drove it last night. Spark time alternated consistently across all four cylinders throughout the extended test drive (where I also added fresh petrol of a different brand to what my sister had been purchasing) – and no new fault codes were generated. Today, I fitted a new set of spark plugs (which were due anyway), but the 'pinking' remains.

One thing I found strange – when scrolling through the outputs in live data, the one designated knock sensor was showing as 'OFF' – even though the engine was running. Could I be looking at a failed knock sensor or wiring issue?

If I can get the knock sensor plug disconnected, I am going to test if it will generate any voltage by tapping the engine block near the sensor whilst it is connected to a multimeter. If I discover that the sensor is faulty, what is the torque setting for the fixing nut/bolt?

William Bamber

A The knock sensor senses engine pinking or knocking and this will apply a pressure to the piezo crystal in the sensor resulting in the production of a small voltage that will alert the ECU to the knocking situation. If the signal is received by the ECU over 25 times within a set period, the code P0326 will be set indicating a circuit range or performance problem. However, if the piezo crystal is not generating a current and no alert is received by the ECU, then it is possible that a faulty knock sensor will go unnoticed by the management system, but the knocking will be heard as the timing is not adjusted to suit the conditions.

There are several tests for the knock sensor, but the action you intend to carry out of checking the output voltage when tapping the engine block will give you the required information.

The normal resistance through the sensor should be 4.87 ohms and the output voltage when operating should be around 2.4 volts. It may be the case that this faulty sensor is the source of the misfire and problems present on your sisters Hyundai, but the knock sensor will indicate as off when it is not actually detecting and indicating a knock from the engine. Driving with the live data displayed should allow you to see the knock sensor showing 'off and on', intermittently switching, as it operates.

The misfire may have been the spark plugs and the pinking that is still present could be due to a non-functioning knock sensor and so replacing this may be a good option.

Interestingly enough, the not so useful information in the Hyundai workshop manual to test this is to "replace with a known good sensor". With this in mind I do think replacement may be the best option.

The torque setting for the knock sensor is given as 5-6Nm.

Diagnostics Doctor
CONTINUED

RENAULT KADJAR

Running fault

Q As a regular reader of *Car Mechanics* for many years, I take keen interest in your *Help!* and *Diagnostic Doctor* sections and hope you can find time to consider my problem which I have set out below.

I can say that having failed to resolve the issues with main dealers and specialist garages – you are probably my last and best alternative to living with the problem which has bugged the car for 4/5 years.

The problem I have with my Renault Kadjar has mystified main Renault dealers, Renault specialist garages and general repair garages over the last four years. It is a Renault Kadjar Dynamique Nav dCi, 5-door hatch, 1461cc diesel engine. Registered 14-12-2015. Mileage 79,000.

First start of the day (gear select P) – the engine starts without hesitation and idles smoothly. Engine can be revved and immediately returns to a steady idle. Select R or D and the engine under load remains at steady idle. When footbrake released, the car begins to slowly move forward or backward (no accelerator applied). At this point the engine starts to splutter juddering the whole car for a few seconds before clearing back to a steady idle.

On occasions the stutter actually stalls the engine. On restart and application of accelerator, the car moves off without problem and drives nicely for the remainder of the day – there being no problem with however many subsequent starts that day.

The fault occurs first start in all weather conditions. If gear select moved to N during the splutter, the fault clears but reoccurs when D or R again selected. The fault may not occur for a couple of days following which the first start problem presents again.

Code read five months ago – P0380 (glow plug/heater circuit A). Glow plugs have been replaced, fault code cleared but did not resolve underlying problem.

Second check – last month – garage technician unable to remember code number. Description – pressure upstream of turbo - which indicated gas pressure pipe blocked. Pipe replaced, fault code cleared but did not resolve underlying problem.

I deactivate Stop-Start – mostly as soon as engine starts but sometimes not until driving. Always put Premium Diesel in tank – have used different fuel additives several times but to no avail.

Car serviced as per manufacturer specification – fuel filter replaced twice in last 12 months - average mileage 51mpg. Battery tested and in good order – two years old.

The car drives very smoothly with auto gearbox performing as expected with virtually no perception of gear change. For your consideration please.

Bob West

A As the problem has been present for some time, I do suspect that the later incidents may not be related to the heart of the problem, but it cannot be ruled out that they are a development of the source.

P0380 indicates a circuit problem and may not necessarily relate to the glow plugs themselves. The code for the problem that was perceived to be the gas pressure pipe blocked may be important as if this was also a circuit problem. It may be an indication of a communication fault at some point.

There are a couple of checks that I would recommend, and it is difficult to know if these have been carried out already.

The first would be to check the live data from the engine when cold, to ensure that the air temperature and coolant temperature sensors are giving an accurate reading. Something as simple as this may be the cause of the problem.

The air temperature sensor is in the MAF sensor, and one of the tests I commonly recommend is to disconnect the MAF sensor with a view to seeing if the problem is still present. Whilst this will bring up a fault code due to the open circuit, the engine control module will then use a set of pre-determined parameters to operate the engine control.

If the engine does run without fault with the MAF sensor disconnected, then this may point to the problem being within the MAF or the air temperature sensor (this is within the MAF).

If after these avenues have been explored, the problem remains, then the next area I would check is to ensure that the engine control module and transmission system multiplugs are in a good clean order. Any resistance however slight in one of these connections can cause the type of problem you have, and so this is another avenue to explore.

Another check to be made is the EGR valve. Whilst this may appear to be operating correctly, as the problem has been present for so long, there is a possibility that the EGR valve is not operating correctly, and this again could cause the symptoms you have.

VOLKSWAGEN CADDY

Bought with EML on

Q Hopefully you can steer me in the right direction. I bought a 2008 VW Caddy 2.0 SDI from a friend with the EML on. I read the codes with a Foxwell Automaster Pro.

These were 119558 (active/static motor for manifold flap (V157) no signal – P3101) and 19557 (open or short ground – P3101). Also, on a different setting on the scanner I had P2102 current and also pending and P2108 pending.

The van had an aftermarket throttle body put on it but to no avail. When clearing the codes, the EML stays off for around three turns of the ignition. When I received the van, I put a second-hand genuine part on but that did not help. On inspection the flap does not move when running or move when the ignition is on.

I have checked the voltage at the four-pin plug going to the throttle body with the following readings:
Ignition on – **1** – Earth 12V Brown; **2** – 0.09V Purple/Grey;
3 – 12-volt Purple/Yellow; **4** – 4.0V Blue/Red.

I have tried and tested all the fuses, should I try another body? Any help you can give will be very gratefully received.

William Fox

A The code P2108 that you have pending is indicating that the throttle actuator control module has a performance problem, and the code 119558 (P3101) is showing that the Intake manifold air control actuator has an open or short circuit to earth.

As the unit has been replaced and with two different units, then I would strongly suspect that the fault will be either in the connecting plug or within the wiring loom.

VAUXHALL VIVA

ABS lights

Q I have a 2016 Vauxhall Viva 1.0 with 36,700 miles. I have had three orange warning lights on the dash and I called my breakdown service who diagnosed an ABS sensor issue. I have had the sensor replaced by my local garage, but the lights are back on again after five minutes driving.

Occasionally they will go off but then come back on after about 10 minutes' drive. The warning lights are the ABS, engine and anti-skid. The ABS and anti-skid lights came back on after five minutes of the ABS sensor being replaced, so I went back to the garage. After using their diagnostic equipment, the lights all went off. Then all three came back on after 10 minutes. I would like to know what the problem may be before I go back to the garage again.

Brian Stowe

A There are a number of reasons why the ABS lights may have come on, and as the garage have read the codes and determined that this is a sensor issue, I will concentrate on this area. There are other reasons such as the brake light switch, the steering position sensor, yaw rate sensor and brake fluid level sensor, but these would all give codes that would not direct the garage or your breakdown service to the road speed sensor that has been renewed.

The codes for a road speed sensor can be ambiguous and although the code is indicating the speed sensor fault, this may not be the sensor. When the sensor itself fails this will normally cause the ABS light to illuminate at the first turn of the ignition. If the light only comes on as yours does when the vehicle is moving, this can indicate that the ABS sensor is not detecting the pickup or reluctor ring, and this will not be the fault of the sensor but can be a corroded or failed reluctor ring.

It will also depend which road speed sensor the fault has been detected on, as some use a magnetic pick-up ring in the bearing and this can be the problem, requiring a bearing change.

The first step will be to get the codes read and ensure this is the same code as previously. If this is the case the next step will be to ensure that the new ABS sensor is fitted correctly and the air gap between the sensor and the pick-up is correct.

If this is not the case, then the pick-up ring is the likely cause of the problem, this will need to be tested using live data on a scanner. The garage should have this equipment, I would recommend that these readings are checked before replacing any further parts.

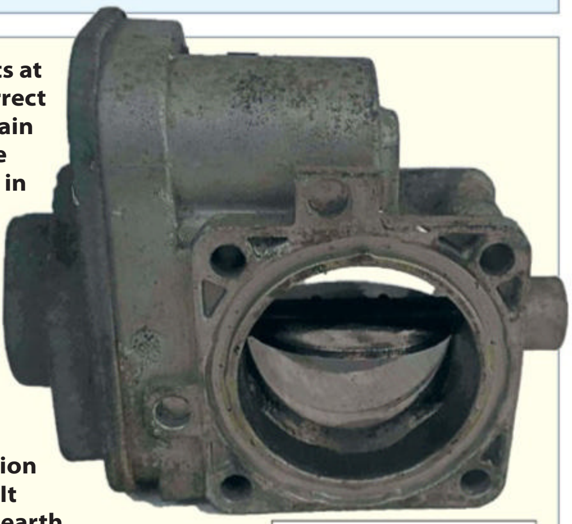
I have seen cases where the tests at the plug all appear to give the correct reading, then when the plug is again repositioned the movement in the loom does allow an internal crack in the wiring to cause a problem.

I would check the continuity of the wiring between the throttle body and the ECU. The terminal 2 on the actuator is connected to terminal 6 on the engine control module and terminal 3 is connected to terminal 25.

If both of these are in good condition, then the earth connection should be checked on terminal 1. It may be worth running a separate earth from this terminal to ensure this is not the problem.

Terminal 4 is fed from the fuse number 24; this should also be checked.

I would have expected the readings to be: 1 – earth; 2 – 0.9 volts; 3 - 4.0 volts; 4 – 12 volts, which does look as though the wires 3 and 4 may be transposed, and so the wiring would be worth checking.



The code is pointing to the motor for manifold flap, though this has been replaced.

Diagnostics Doctor

Diagnostics Doctor is a **FREE** helpline service for *CM* readers – including trade readers – who are struggling with diagnostic/engine management related faults.

Steve Rothwell will answer all your queries. He will need as much detail as possible: **MAKE, MODEL, YEAR, ENGINE CODE** and **NUMBERPLATE** of your vehicle – and the type of management system installed. Obviously, Steve will not be able to assess the vehicle up close, so his answer will be on the basis solely of your description. This is a FREE service and it may take some time to respond to certain problems. If you would like to receive a personal response via post, please enclose an SAE.

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Common abbreviations

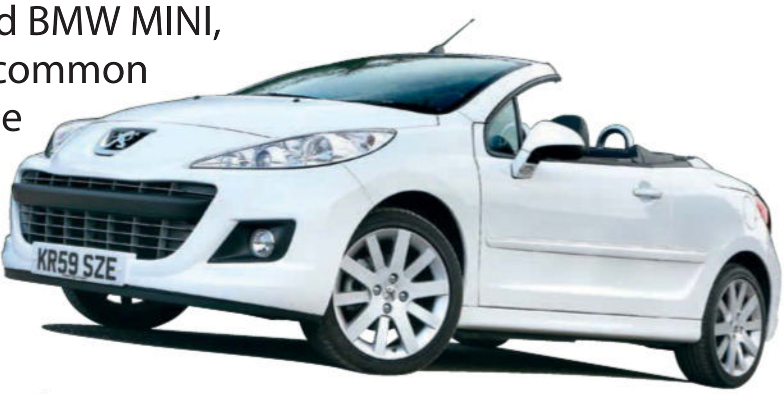
ATS	Air Temperature Sensor
AFM	Air-Flow Meter – not a MAF type (see below). It could be, for example, a vane type
CAS	Crank Angle Sensor
CPS	Crank Position Sensor
CTS	Coolant Temperature Sensor
ECT	Engine Coolant Temperature
ECM	Electronic Control Module
ECU	Electronic Control Unit
EGR	Exhaust Gas Recirculation – meters exhaust gas back to the intake manifold
EML	Engine Management Light
EMS	Engine Management System
EPC	Electronic Power Control
FCR	Fault Code Reader
HT	High Tension – ignition output to the spark plugs
IAV	Idle Air Valve
ISCV	Idle Speed Control Valve – usually operated by a motor controlled by the ECU
LOS	Limited Operating Strategy – if the ECU detects a malfunction, it runs a programme to allow the car to still go, but at reduced efficiency
MAF	Mass Air-Flow meter
MAP	Manifold Air Pressure
MIL	Malfunction Indicator Lamp
PCV	Positive Crankcase Ventilation – takes crankcase gases and recycles back to the inlet system
TBPS	Turbo Boost Pressure Sensor – used by the ECU to regulate turbo output
TPS	Throttle Position Sensor
VSS	Vehicle Speed Sensor
WOT	Wide Open Throttle

Electronic Diagnostics

Peugeot 207 CC 1.6

Tracing and fixing faults in electronic engine management systems

Found in many a Peugeot, Citroën and BMW MINI, **Rob Hawkins** discovers some of the common diagnostic-related issues that can arise with the larger of the Prince engines from the PSA Group when he visits AES near York to look at a 207 CC.



Code-named the EP6C, but more commonly known as the Prince engine, PSA's range of 4-cylinder petrol engines was introduced in 2005 and used widely in everything from a BMW MINI to the Peugeot 207 CC seen here. The smallest is a 1.4-litre, but we're looking at the larger 1.6, which is naturally-aspirated and has a combination of old and new variable valve timing equipment.

That variable valve timing consists of a traditional second set of lobes on the inlet camshaft, which are mechanically engaged during high engine revs. There's also adjustment of both camshaft pulleys (inlet and exhaust) to help fine-tune valve timing and improve engine performance.

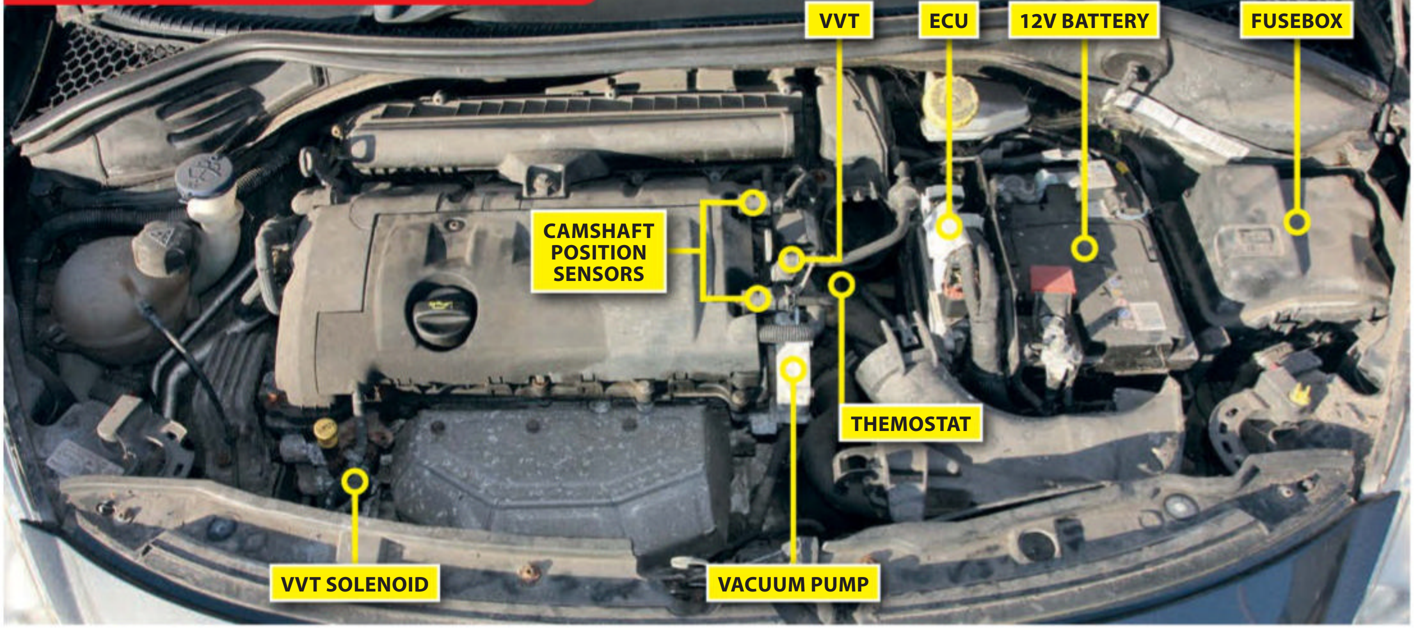
This all sounds impressive, along with a timing chain instead of a belt, so what can go wrong? As you'll see from our list of faults, quite a lot, although we've gathered all this information from numerous cars that have been brought to Mark Shipman at AES York over several years. The ones that haven't been problematic are not so easy to account for.

Neglectful maintenance is sometimes to blame, especially when the engine oil level becomes low, which results in issues with the variable valve timing and timing chain. Oil consumption can arise if the cylinder bores become worn, which is unfortunate, but possibly not surprising thanks to a long service interval of every 20,000 miles or two years.

TYPICAL FAULTS

1. STICKING THERMOSTAT
2. VVT ISSUES
3. MISFIRES
4. TIMING CHAIN FAILURE
5. WATER INGRESS
6. OXYGEN SENSOR FAILURE
7. HUNTING AT IDLE

1598cc 4-cylinder petrol



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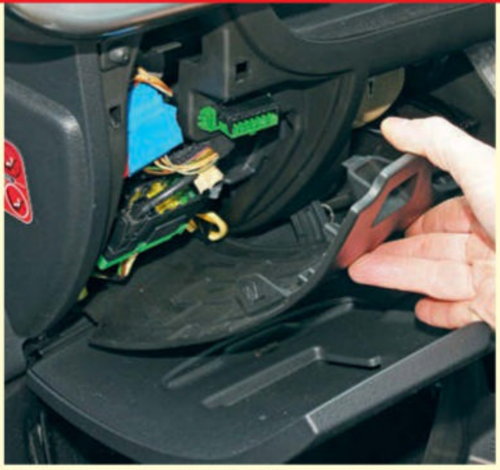
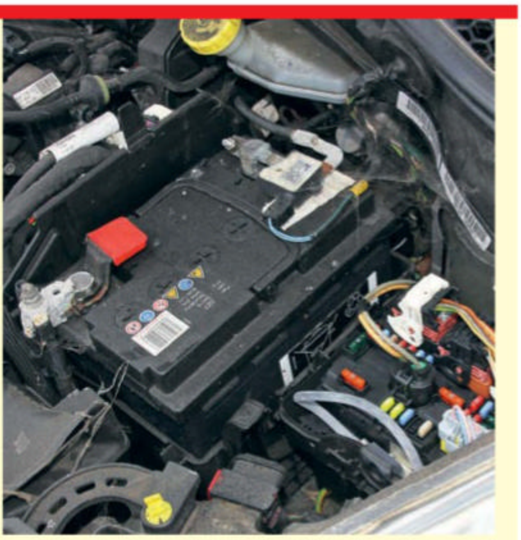
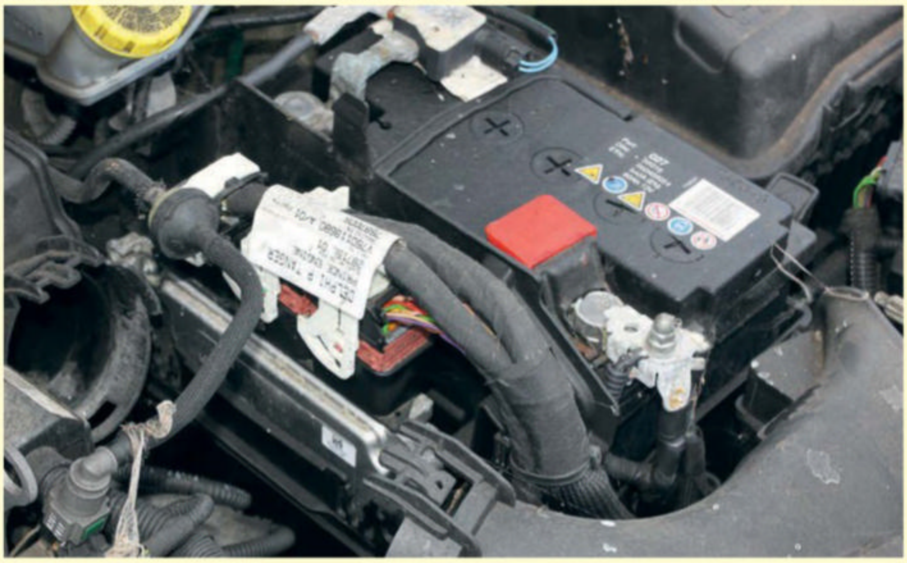
Typical PEUGEOT 207 COMPONENTS



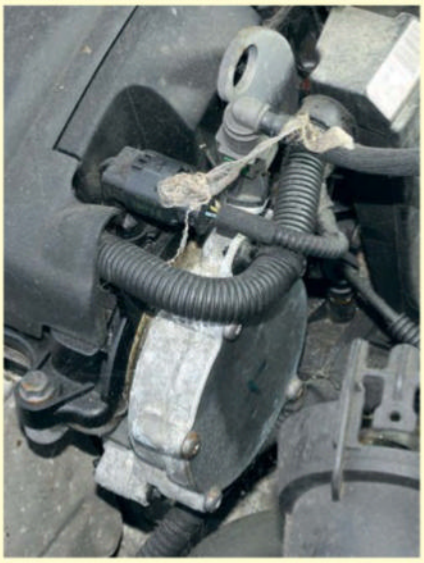
1 ◀ The EOBD port for connecting diagnostic equipment to the vehicle's ECU is located inside the glovebox. Open the glovebox and detach a plastic panel close to the nearside to reveal the port.



2 ▶ In the nearside of the engine bay, there's the 12V vehicle battery and a main fusebox. Check the battery's terminals are clean and secure. When using diagnostic equipment, connecting a booster pack to the battery will help to reduce the risk of voltage drops and anomalies. See *Fault 5* for problems with the fusebox.



3 The ECU is vertically mounted to the offside of the vehicle battery. Its main connector plugs are secured along the top edge. Our photograph shows that part of the induction system has been removed, which makes it easier to view the ECU.



4 There's a vacuum pump on the end of the exhaust camshaft, which provides servo assistance to the brakes.

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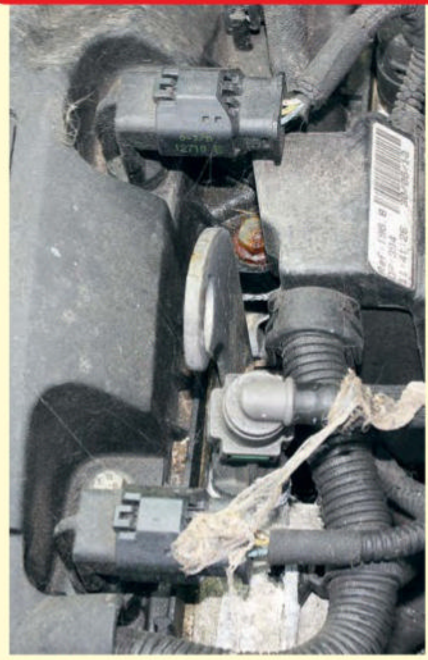
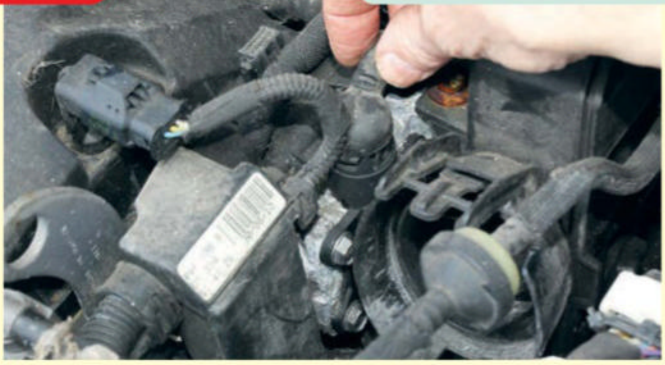
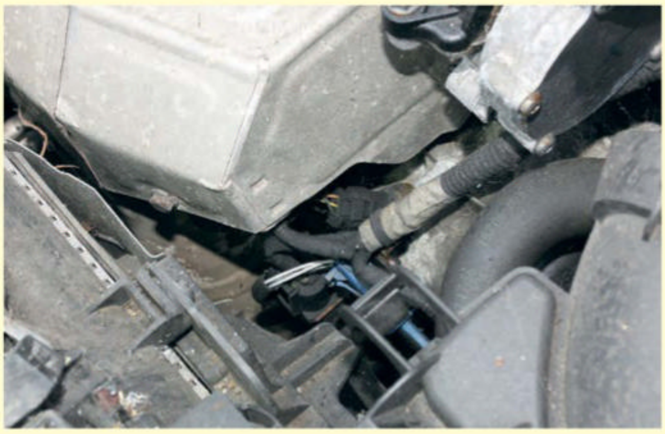
Typical PEUGEOT 207 COMPONENTS



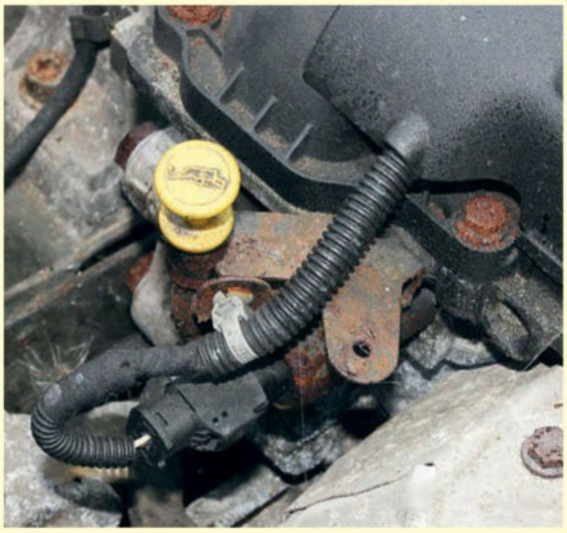
5 Camshaft position sensors for the exhaust and inlet are easy to spot at the back of the engine (opposite end to where the timing chain is located), close to where the vacuum pump is fitted (see the previous step).

6 ▶ On the back of the inlet camshaft, there's a sensor and mechanism to switch the profile of this camshaft at higher engine revs (similar to a Honda VTEC system).



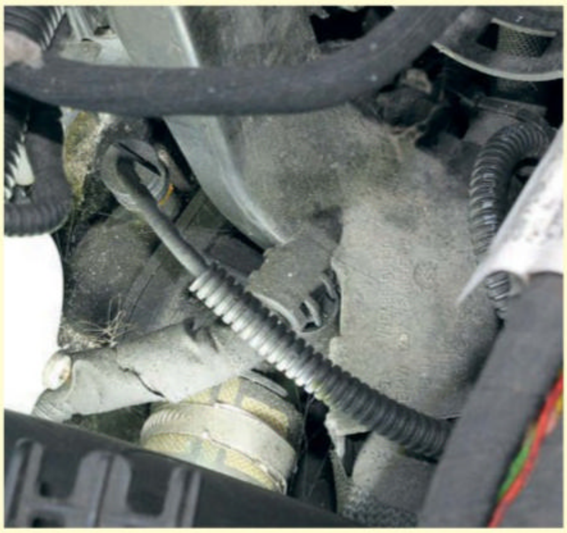


7 ◀ Along the front of the engine bay, there's the exhaust manifold, which is concealed by a heatshield. Underneath it, there's room to access a pre-cat oxygen sensor, which is next to the oil filter that has a pressure sensor.



8 ◀ There's a VVT solenoid with a connector plug next to the engine oil dipstick. This controls the adjustment of the camshaft pulleys to alter the engine timing at higher rpm.

9 ▶ Returning to the back of the engine (above where it's attached to the gearbox), there's a plastic thermostat housing with one or perhaps two coolant temperature sensors. See *Fault 1* for further details on this.



TECHNICAL SPECIFICATIONS

Engine	1598 4-cylinder twin-cam petrol
Engine oil grade	5W-30 fully-synthetic *(other grades are recommended, depending on climate)*
Oil classification	PSA B71 2312 and PSA B71 2290
Oil capacity/schedule	4.3 litres with filter every 20,000 miles or 24 months *(10,000 miles or 12 months, we say!)*
Brake fluid	DOT 4

TORQUE SETTINGS

Sump drain plug	30Nm
Oil filter	25Nm
Spark plugs	25Nm
Oxygen sensor	47Nm
Road wheels	100Nm

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Typical PUG 207 FAULTS

STICKING THERMOSTAT

FAULT 1

▶ The thermostat is known to stick in the closed position, and with the coolant temperature sensor fitted after the thermostat (ie. not in the engine side), it can continue to read cold, despite the coolant in the engine is above 82°C (the temperature at which the thermostat opens). Mark says this was a recall issue, whereby a second coolant temperature sensor was fitted into the bleed screw in the thermostat and a revised wiring loom was included.

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VVT ISSUES

FAULT 2

▶ With a second set of lobes on the inlet camshaft, this oil-controlled part of the variable valve timing can have problems, especially if the oil level is low. Mark has found that these mechanical faults can raise some misleading airflow faults, but with no mass airflow (MAF) sensor (only a manifold absolute pressure (MAP) sensor), the diagnosis is often wrong. Instead, he says that the sensor can sometimes fail on the end of the inlet camshaft (see *Step 6* of the previous section), and also the motor for changing the profile of the inlet camshaft (fitted on to the back of the inlet camshaft).

MISFIRES

FAULT 3

▶ This can arise from timing chain issues, but also through failure of the coil packs and spark plugs. Mark has found the spark plugs are sometimes overtightened (according to Autodata, they should be tightened to 25Nm), resulting in cracks in the ceramic part of a plug and consequently failure that causes a misfire. The composite camshaft cover can warp, allowing engine oil to leak and collect around the spark plug holes.

TIMING CHAIN FAILURE

FAULT 4

▶ Sometimes this problem starts with low oil level issues, but Mark says that he has found the timing chain's tensioner can fail, resulting in the chain becoming stretched. Rattles from the front of the engine can be heard. Misfires can arise.

WATER INGRESS

FAULT 5

▶ Water from the thermostat housing can travel up to the fusebox in the nearside rear corner of the engine bay (see *Step 2* of the previous section). Mark says that the connector pins for the headlight relays and fuses are often the first to corrode and cause problems.

OXYGEN SENSOR FAILURE

FAULT 6

▶ Mark has found the heater circuit for the pre-cat oxygen sensor (see *Step 7* of the previous section) can fail, but despite replacing it on numerous customers' cars, he has discovered that the ECU becomes damaged and often needs to be replaced soon afterwards.

HUNTING AT IDLE

FAULT 7

▶ With a sealed crankcase, there are seals for the engine oil dipstick and filler cap. If these seals become worn or brittle, then air leaks can arise, which results in the engine hunting at idle (the revs rise and fall). Conducting a smoke test (adding smoke to the induction system) will help to identify any air leaks.

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DRIVING IN FRANCE

Steve Rothwell was about to embark on a road trip to France in his 2013 Honda CR-V petrol. It has been some years since he last drove in France, so he updates himself on the laws and changes since his last trip.

It has been a number of years since I last took a trip in my motor across the channel and drove on the other side of the road. As I was about to embark on a short visit to Disneyland Paris with the family, I decided to check that things were still as they were when I last drove over there in 2012. I found that there had been several changes with a few more due to be brought in shortly.

The need to carry a hi-vis jacket for each occupant of the vehicle was still required, but the requirement to carry a breathalyser is no longer applicable.

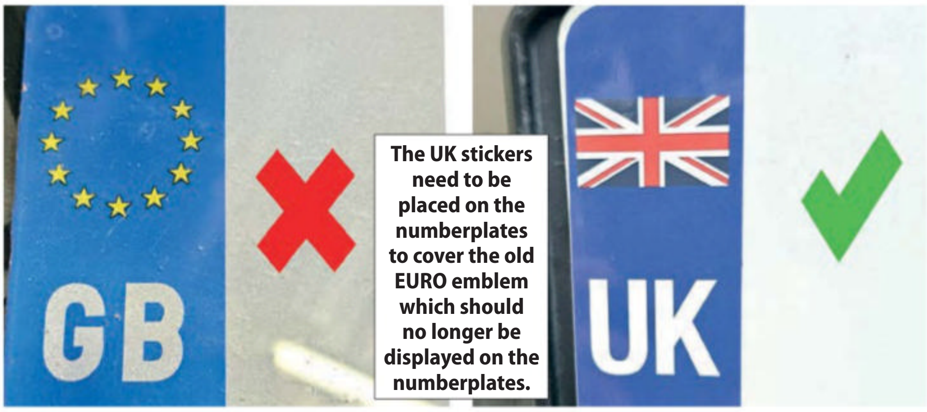
The other change since my last visit is that the old GB sticker and logo on numberplates are now not compliant. The stickers and/or the numberplate logo should represent a UK insignia.

But the biggest change since I last ventured to the French shores is that France now has low emissions zones, and vehicles now need a sticker (Crit'Air Vignette) showing compliance to enter these zones. Failure to do so will incur a penalty of up to 135 Euros.

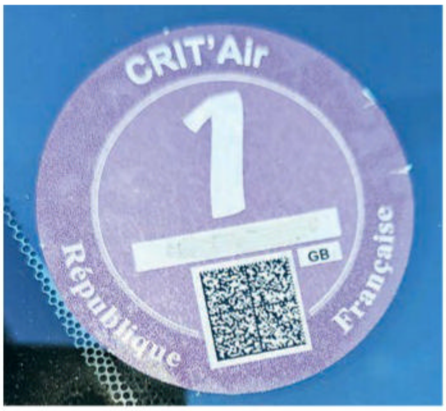
The good news is that the sticker is easily available and can be purchased for around €4.80 prior to the journey from the French website which does have an English language option so translation will not be required. The website is **https://www.certificat-air.gouv.fr/** and once the form is filled out, the sticker showing the level of air pollutant from your vehicle will be dispatched by post arriving within a few days – mine took just over a week.

Whilst the sticker is only required in certain areas of France, if you are arriving via the ferry or the tunnel, there is a very good chance that you will be entering one of the zones on your journey. Do use the website address I have listed as searching online may

The UK sticker is now required to be displayed on the back of your vehicle, and the old GB sticker is not valid.



The UK stickers need to be placed on the numberplates to cover the old EURO emblem which should no longer be displayed on the numberplates.



The Crit'Air Vignette sticker should be displayed on the lower right-hand corner of your windscreen.

lead you to one of the unofficial sites that charge a fee for the service, pushing the price up considerably.

Another change I encountered was that now when booking the ferry, API (advanced passenger information) was needed, and just like when booking flights the passport number and details of the passengers travelling must be filled in.

Depending on your travel date you may also need to consider ETIAS which is due to come in sometime during early summer 2025. This will be similar to the ESTA system used for travellers to the USA, the ETIAS is applicable for stays up to 90 days in any 180-day period, so should easily cover any holiday arrangements.

This will come in six months after the introduction of EES (Entry/Exit System). Which is the first step of modernising and controlling the EU boarders.

More details at the official website **https://travel-europe.europa.eu/**

I would again warn against finding the application site via a search engine, as there are companies that will act as a go between and charge a hefty fee to do so, going direct will be the cheapest and safest option.

It is also worth noting that if you are travelling on a non-UK passport you will need an ETA (Electronic Travel Authorisation) to travel to or transit through the UK. Details on this can be found at the **https://www.gov.uk** site.

Once in France

So, you have ticked the boxes and entered France with your vehicle, having remembered to check that your insurance will cover you, what else do you need?

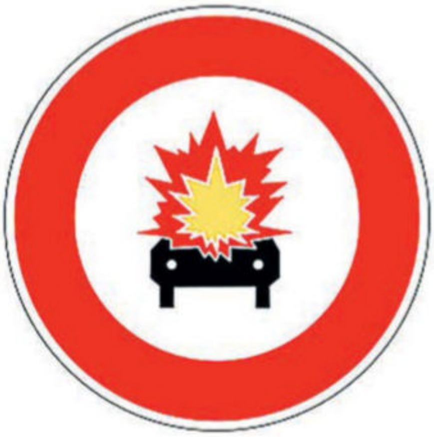
You are required to carry your vehicle documents including the insurance document, MOT and the V5. As well as these you will also require a hi-vis jacket for every occupant of the vehicle, a warning triangle, spare bulb kit and you will need to have the UK stickers as mentioned earlier. The warning triangle and hi-vis jackets do need to be readily accessible and so not tucked under the boot floor. If you are stopped, you will be asked to show these, and they need to be to hand. If you wear glasses for driving it is also compulsory to carry a spare pair.

Any GB or EU markings on the numberplates will need to be covered with the stickers now available showing the UK symbol.

One point that, although not applicable to me, may be of interest to others, is that electric car charging points in France are more easily found. A good friend recently undertook a journey through France in an EV and was delighted at the ease of finding the charging stations – and that they all worked.

So, you have safely arrived in France you have the required documentation and the necessary equipment and set off on the road. The first thing you need to be aware of besides the fact that the French drive anti-clockwise around roundabouts is that there are quite a few other variations in traffic regulations. If you encounter rain, the speed limit will alter. The maximum limit of 130km/h will reduce to 110km/h – and in poor visibility the limit will reduce further to 50km/h. During normal visibility when on the motorway there is also a minimum speed limit of 80km/h for vehicles travelling in the outside lane.

If you are using a sat-nav to navigate around the French roads, you should also be aware that French law prohibits drivers from using devices that are capable of detecting speed cameras or that will warn drivers of their location. Penalties for this are severe and instant fines of up to €1500 can be issued along with confiscation of the device and vehicle. This includes GPS-based systems which can display fixed speed camera locations as points of interest. If you have this type of system, the camera notification should be disabled.



This road sign does not indicate that your vehicle may burst into flames. It's just confirming you should not carry explosives in this area.

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Headlamp deflectors are needed for the vast majority of vehicles, although some such as those with LED headlights can be adjusted to drive on the right side of the road without the need for blanking stickers. A reflective jackets, a bulb kit and a warning triangle are compulsory, and these should be accessible if needed, so not hidden under the boot floorspace. I also carry a fire extinguisher.

French police do have the power and do exercise the power to impose instant fines for motoring offences.

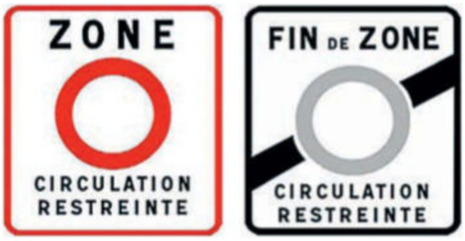
Road signs

The shape and colour of French road signs can give you a good idea of what to expect, and many of the road signs will be either self-explanatory or will look very much like those we are all used to.

Triangular signs which have a red border and a white background are warnings – and the symbol shown in the centre will give the reason. Yellow triangular signs with a red border are temporary warnings, so these may alert of situations that are not long-term, such as flood.

Circular signs may have a white border and a blue background, or a red border and a white background – these are regulatory signs that inform you of the laws and obligations governing that section of road – for example, showing no left turn, no overtaking or weight restrictions.

Square signs which normally have a white border, and a blue background give information such as parking, bus stop, or other area relevant details.



This one indicates the start and the end of a restricted zone, in which the Crit'Air Vignette sticker needs to be displayed to prevent a fine being applied.

Preparation for a road trip to France

TABLE OF SPEED LIMITS

SPEED	MOTORWAY	DUAL CARRIAGEWAY	MAIN ROADS	BUILT UP AREAS
Normal conditions	130km/h	110km/h	80km/h	50km/h
Rain or snow	110km/h	100km/h	70km/h	50km/h
Low visibility less than 50M	50km/h	50km/h	50km/h	50km/h

As in the UK, signs giving road details are colour-coded and so blue signs indicate motorway, green signs main A-roads and yellow signs are showing a temporary route such as a detour and white signs show the local road information.

If you see the wording **'Cédez le passage'** on a road sign, this means you need to give way. The phrase **'allumez vos feux'** is another important phrase to look out for as this is instructing you to turn on your lights. You will be entering an area where driving lights are mandatory at all times of the day. When you see the sign **'fin d'allumage des feux'** this marks the end of the mandatory lights zone. This information will be displayed on a blue circle with a white edge.

Other important words on the road are **'Gauche'** = Left and **'Droite'** = Right. **'Route barre'** indicates that the road is closed, and **'chaussée deformer'** that the road is in bad condition.

'Toutes Directions' seen on road signs indicates all directions. The word **'Rappel'** under a speed limit sign is simply to remind you that you're still in that speed area.

Traffic lights are much the same as in the UK except you may see a flashing amber light. This indicates caution, slow down or proceed but give way to vehicles coming from the right, and a flashing red light indicates no entry. It may also indicate a level crossing or exit used by emergency vehicles.

If a red light is accompanied by a yellow arrow, you may proceed in the direction indicated by the arrow, provided you give way to vehicles travelling in that direction, as well as to pedestrians.

Children below the age of 10 are not allowed to travel in the front seats of vehicles without using a special child restraint. There are exceptions if there is no rear seat, or if the rear seat is already occupied with children under 10 or there are no seat belts. The French police are authorised to impose and collect on the spot fines of up to €750 from drivers who violate traffic regulations, and in some cases, the vehicle can also be confiscated.

Alcohol limit in France

The maximum legal level of alcohol in the blood for drivers of private vehicles in France is lower than the 0.08% blood alcohol content in England, Wales and Northern Ireland. It's 0.05%, which is the same as Scotland.

The police do have the power to carry out random breath tests, and no reason needs to be given. The test is also compulsory after an accident that has caused injury or if a serious motoring offence has been committed. If you are a new driver (three years of under) the drink drive limit is 0.02%.

If you need driving glasses you must carry a spare pair in the vehicle, just in case there is a problem with those you are wearing.

Fuel

When you go to refill at a French fuel station you will see Sans Plomb 95 and Sans Plomb 98 – the standard and higher rated octane petrol. SP95-E10 (Sans Plomb 95 Octane + 10% Ethanol) is widely available, and like our E10 Unleaded is not suitable for older vehicles.

Diesel is marked Gazole – there is also diesel fuel which contains 8% biodiesel. This 'B8' isn't suitable for use in all cars, and you should check with your vehicle manufacturer before using it.

If you breakdown

The majority of French motorways are managed privately, and, on these roads, it is against the law to call for your own assistance company to aid you if you are in trouble. If you do breakdown on a motorway or main road, you should look for the orange emergency telephones which are situated every 2km. You should call the police or an official breakdown service using these phone.

If there is not an orange telephone available, you can dial 112 on your own phone to contact the emergency services, who should then be able to assist you.

The Eurotunnel LeShuttle opened in 1994 and is still a popular choice to cross the English Channel into France due to its 35 minute travel time.

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Our Cars

Andrew Everett

Special Contributor

Fixed & sold

The 118d is being used regularly and I've grown to like it – I ran an identical red example for *Car Mechanics* eight years ago.

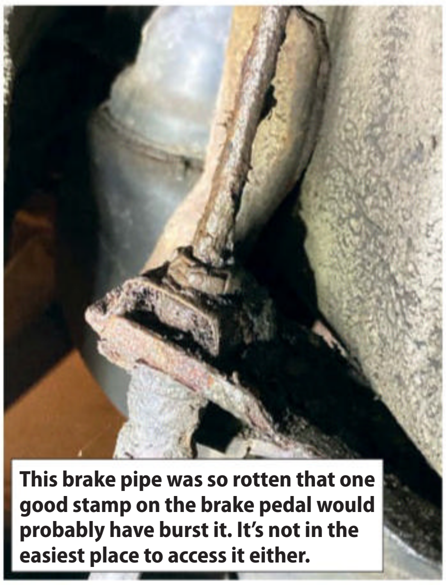
Last time, I regaled you all with how I rescued a 2001 BMW 320i Auto Touring from Copart and reversed some of the neglect that led to its near demise – a water pump, viscous fan coupling and a rear damper top mount that like most BMW's involves removing a lot of boot trim to access. What a cow. It's well over an hour to carefully remove and refit the bolted and screwed down trim sections with all the different size screws, and 20 minutes to replace the top mount – in the event I replaced both sides.

The next job was to renew a spectacularly rotten rear brake pipe, the one by the driver's side rear spring that goes to the flexy pipe. There was no way this was going to clean up and live another day, so I had to bite the bullet and make a new one from copper pipe, splicing it into the steel pipe by the boot floor. With the rear damper already removed for the top mount swap, I forced the rear coil spring out to give enough room – perhaps I'd forgotten how to change these, but it was a complete bastard to get out and back in again. Even so, the brake pipe replacement was easy enough with a superb handheld Draper pipe flaring tool and the brake pipe cutter. The rear flexy hose lived to see another day, but the rear discs and pads did not. They were just too rusty, so I binned them and fitted some febi items that have been on the shelf for a few years. Thankfully the handbrake shoes and mechanism were all good, so the new discs went on fine, and the handbrake adjusted up. Even better, the rear caliper bleed screws all undid so I was able to bleed the rear brakes after the pipe replacement.

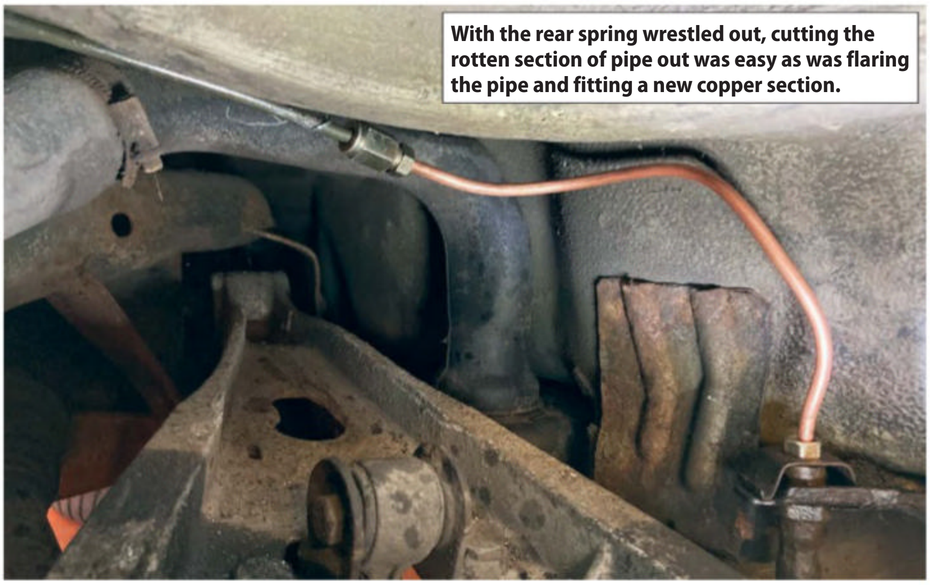
So, now it was safe to drive and not running hot, even more so once I'd replaced the original 2001 thermostat with a new febi one. With the fan and shroud removed (again) it's a pretty easy job that takes about an hour.

What about the aircon?

It must have had gas in as the compressor engaged when the button was pressed but no cold air emerged. In the end I just ran it around the corner to Kwik Fit along with some wheels and tyres in the boot for tyre swaps and balancing. A couple of hours later the wheels were already – as was the 320i, complete with ice cold air. It held a vacuum and had no visible leaks, and we reckon it had just never been regassed since new. There was still a bit of R134A in there to engage the compressor, ruling out a hole or leak.



This brake pipe was so rotten that one good stamp on the brake pedal would probably have burst it. It's not in the easiest place to access it either.



With the rear spring wrestled out, cutting the rotten section of pipe out was easy as was flaring the pipe and fitting a new copper section.

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The old rear discs don't look that bad here but, on the road, they were very graunchy when the brakes were applied. A new febi set in stock fixed that.

Both rear damper top mounts were in trouble as were the bump stops, and dust covers – the dampers themselves were fine, however.

With that done, I taxed it and used it for a few days (well, three) before deciding that it wasn't for me. The BMW 118d does just about everything better – twice the fuel economy (25mpg around town isn't fun), road tax is almost half of the ridiculous £415 DVLA want and the 320i isn't exactly quick enough to compensate. And it's an E46, a BMW I really don't have much time for – they're just so needy and fragile now. I had it on the road for a day and the driver's window regulator failed – yes, you're on eBay tomorrow! Thankfully it sold quickly and out of my life it went with a small profit but a lot of work to get there.

A new thermostat completed the 320i cooling system overhaul and was easy enough to fit.

IN ANDREW'S GARAGE

1989 730i Still on SORN. Yes, I know – I will be using it this year and actually getting some miles on it.

1994 318Ti Following its 1600-mile trip to Munich and back, it's had a cylinder-head overhaul to restore performance.

2005 118d A set of Goodyear tyres has made an improvement, and a BMW airbag recall was carried out by the main dealer.

1-series affections

The 118d has just about wormed its way into my affections. The best thing I've done lately is to replace the garbage rock hard zero wet grip Chinese tyres (the brand name sounds like 'Excellent', and they really aren't) with a set of Goodyear Efficient Grip 205/55x16. These were supplied and fitted by a local part-worn emporium for £140 the set, all with over 6mm a corner which is just fine. I even bought another set of four 2024-dated Efficient Grip boots recently from Facebook marketplace with a solid 7 to 8mm average for £120. The car has been behaving well of late and a letter from BMW informed me that I needed to have the driver's airbag replaced under a safety recall which was well timed as the airbag light pinged on the day before. However, this turned out to be the same problem as last time, namely the need to remove, clean and refit the airbag module connector wire on the battery plus terminal. Being a September 2005 build car, it has the early pre-E90 type battery plus terminal which is now hard to find used and a fortune new. Yes, you can just retrofit the later one but a BMW breaker on eBay (ASWR) had a good early used one for 25 quid delivered so I just ordered it so I have it in stock. I've had the 118d for 15 months now and I intend to run it for as long as I can which is until a major mechanical failure.

I took it into Sytner Sheffield to have the airbag recall done – it took about an hour with a wash and vacuum plus an informative vehicle health check that threw up nothing more than some cracks in the front flexy brake hoses – not bad for a 2005 car. Yes, I replaced them. Sytner also topped up the near-empty screenwash tank with the genuine BMW stuff and I'm now a convert – it really is good. £22 for five litres of concentrate isn't cheap but it works out about the same as that five quid rubbish elsewhere and it does a much better job.

The 1994 BMW 318Ti has seen some work since it got back from its Germany trip last October. The big one was to take the head off and get all the exhaust valve seats recut and replace the odd valve with a new one plus a skim and stem seals – but more about that next time. Suffice to say, it's running very well and I'm looking forward to Spring when I can start using it again.

The 1994 318Ti had a top-end overhaul late last year – some new valves, skim, pressure test, stem seals plus new gaskets and head bolts. Well worth doing.

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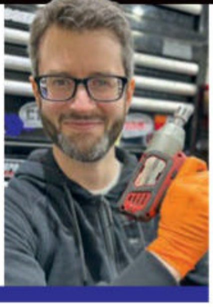
Our Cars



Peter Clayton

Special Contributor

Solenoid struggle

It all started during a lazy drive around town in my 2006 BMW 130i. Going up an incline I felt the engine's power suddenly decrease slightly, immediately followed by the infamous engine management light illuminating on the dash. Luckily the DME, which in BMW speak is the Digital Motor Electronics (or engine ECU), did not proceed to switch into limp-home mode, but I gingerly made my way back home and plugged in my Foxwell diagnostics scanner to see what was up.

While the Foxwell gives you options to scan via 'OBDII', I chose to automatically detect the VIN via the manufacturer-specific option. When reading out the codes, this provided me with the hexadecimal 2A82 – which is the specific code used by BMW. Luckily the Foxwell also provides a description of the code which read 'DME: VANOS intake'. This would be referring to the variable valve timing system employed on the intake side. While it is not unknown for the VANOS system itself to fail, the solenoids that control the oil flow to them are prone to demise. Having never even inspected these since I purchased the Beemer a few years ago, it made sense to renew them. The job is very straightforward and febi provide the solenoids for quite a reasonable price.

It's a good idea to hold an oil spill kit in your garage. I only had paper towels to hand, but also liberally sprinkled laundry detergent to help remove the stains.

If you were to ever peruse the BMW forums online you may read that the VANOS solenoids can be cleaned with various degreasers or carb cleaners, however this usually only has a short-term effect, and you are much better off renewing them with either units straight from BMW or OE-spec aftermarket specialists such as febi. Before committing to purchase, first ensure the VANOS check valves are in decent shape. They have a fine mesh filter and should this clog, it will prevent the necessary oil supply from reaching the solenoids. As I had inspected the originals only 1000 miles ago, I was pretty confident that the solenoids would indeed need renewing. Seeing that the check valves were the factory originals I decided to go ahead and replace them for good measure.

Solenoid switch out

Fitting the solenoids themselves was very easy. I loosened four Torx screws holding the plastic air intake to release it and provide better access to the front of the engine. After this, it was a case of laying some kitchen paper down in front of the solenoids, pulling up the metal locking clip to undo the electrical connection, undoing a 10mm single bolt and easing out the old solenoid. Just remember to pull out the old O-ring seal and carefully clean the outer portion of the bore in the head.

IN PETER'S GARAGE

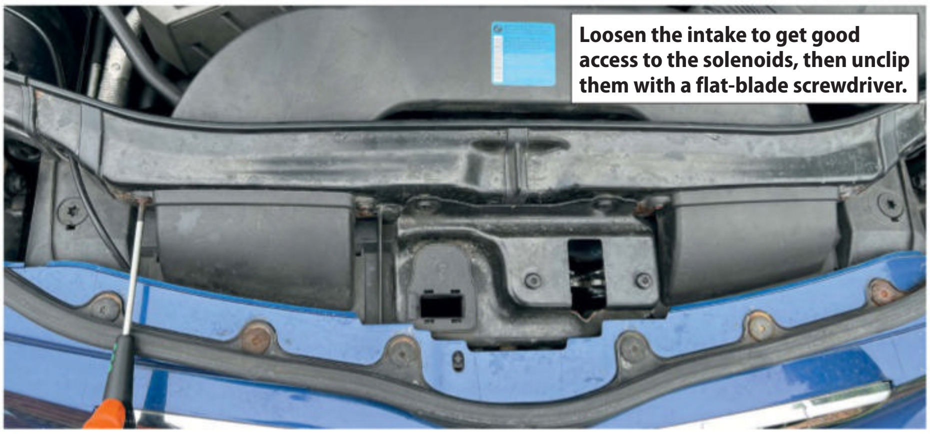
2001 VW Lupo GTI Owned for ten years, this 1.6 pocket rocket has been stripped out for track use, having an uprated engine and limited slip differential.

2006 MINI One R50 Owned from new, this 1.6 Pepper Pack version handles amazingly well – the CVT autobox slightly tarnishes the experience. The better half's daily drive and she won't part with it.

2006 E87 BMW 130i My second summer toy – in M-Sport guise I think is quite a handsome thing with plenty of performance (and typical BMW niggles!)

2013 Skoda Fabia My daily commuter, just enough pep from the 1.2 to get to motorway speeds. Has been the most reliable car I've owned.

A pair of VANOS solenoids and check valves would help clear the EML on the dash.



Loosen the intake to get good access to the solenoids, then unclip them with a flat-blade screwdriver.

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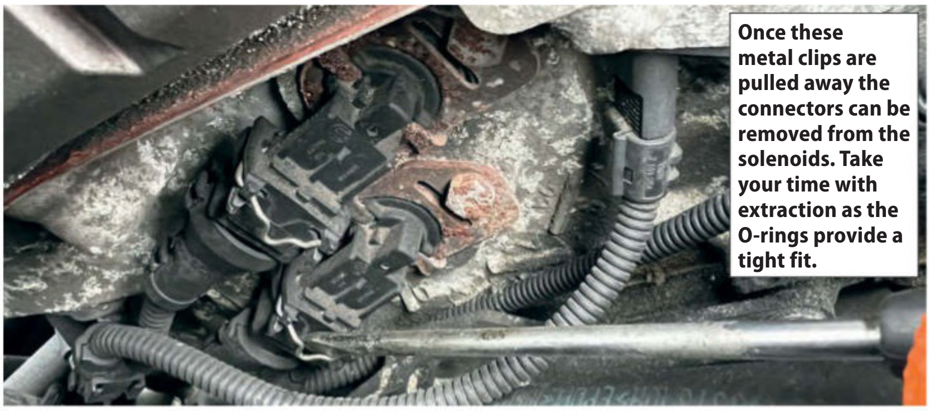
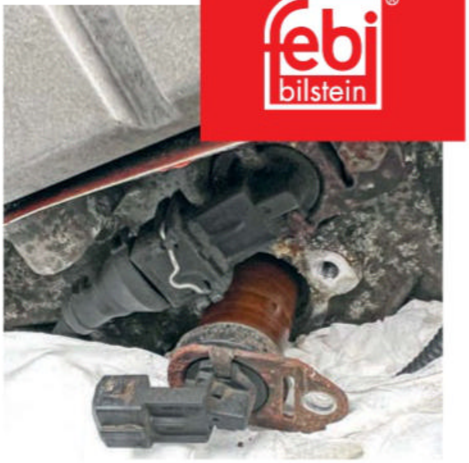


Once these metal clips are pulled away the connectors can be removed from the solenoids. Take your time with extraction as the O-rings provide a tight fit.



The old solenoid can be pulled free and old O-ring removed – I used a plastic pick here to avoid scratching up the bore.

As febi provide a new O-ring in the box, I lightly lubricated it with engine oil and ensured it sat flush in the cylinder-head. I then eased in the new solenoid and tightened up the nut. It's best to do one solenoid at a time as you do not want to risk accidentally mixing up the intake and exhaust wires as the connectors are very similar!

Oil be damned

The final thing on the agenda was replacing the check valves, which are notoriously difficult to see on the N52 engine without taking the offside arch liner off. With an inspection mirror it is however possible as I completed this exercise last year. Now I had a borescope in my arsenal I could easily shape the scope down the side of the engine to see the check valves. A T40 bit will have them unscrewed and they should freely come out. When installing the febi units (p/n 178664), however, I felt the usual resistance of the threads suddenly disappear and assumed the Torx bit came free, which happened on both valve installations when using a torque wrench set at BMW's specification of 15Nm. As I thought that would be tight enough anyway, and without properly checking, I decided to start the engine to ensure that it was idling correctly and there were no leaks from anywhere. Within a matter of seconds oil was gushing a torrent from the side of the head and down my driveway, so immediately switched the engine off. Peering into the engine bay I could see half of the valve had popped out leaving the other half deep in the head!

Clearing up the spillage was my priority, so plenty of absorbent material was used to soak everything up, followed by lashings of laundry detergent to help emulsify the remains when the rain would come (thanks to a fellow *CM* reader's letter about using this stuff!). I spent the next hour or so extracting the other half of the valve from the head. This was achieved by grinding down the nose of a pair of long-nose pliers so they were very thin. There was then enough space to grab the edges of the valve and twist it out, using my borescope to see what I was doing!

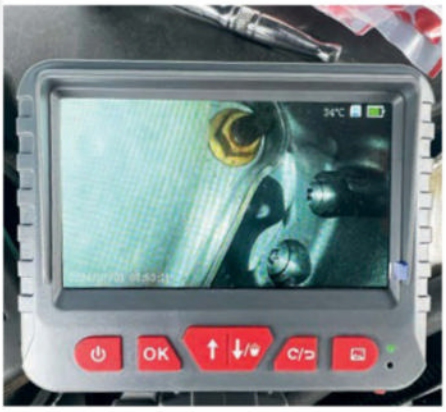
Investigation

Keen to find out what went wrong, I immediately checked my torque wrench, which was aligned at 15Nm. This was the specification printed on the original BMW parts and recommended by BMW themselves – why then, would the valve seemingly fail? Martyn Knowles, our Editor, reached out to febi bilstein and explained the situation to understand if I did something wrong. Within just a few days, we not only had an answer but an impressive solution. The units that their manufacturer designed had a torque tolerance slightly too close to the 15Nm requirement and due to their remarkable warranty claims being one in less than a few thousand units they had not been made aware of any issues to date. As a result, they were quickly on the case to upgrade the part, changing the material of the inner thread to steel from aluminium, which they bench tested to over 26Nm! Needless to say, this shouldn't be an issue even for those wielding mis-calibrated torque wrenches.

With everything washed down, and the engine topped up with fresh oil, I was happy to report that the code didn't come back when cleared and power was fully restored.

The check valves are accessed low down to the side of the engine.

A borescope was used to help remove and install the new valves – the broken valve was taken out with thinned-down pliers.



This is what the fully installed check valves look like.

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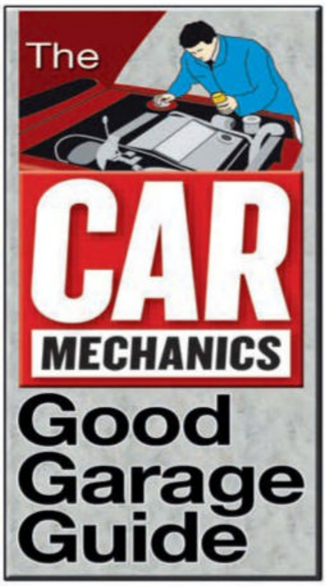


This listing is published every **THREE** months and will next appear in our **August 2025** issue. We welcome further nominations (from satisfied customers only please, no self-nominations) of businesses to be included, so that we can make this listing as useful as possible to readers throughout Britain and Ireland.

Please write to: ***Car Mechanics* Good Garage Guide, Kelsey Media, The Granary, Yalding Hill, Yalding, Kent ME18 6AL.** Or email: **martyn.knowles@kelsey.co.uk**

AVON

Lockleaze Service Station, Lockleaze Road, Bristol BS7 9RU.

BERKSHIRE

Mike Farina Auto Services, 21 Sedgewell Road, Sonning Common, nr Reading, Berks RG4 9TA. Tel: 0118 972 4036. *Servicing, repairs.*

BUCKINGHAMSHIRE

Stokenchurch Service Centre, Wycombe Rd, Stokenchurch, Bucks HP14 3RR. Tel: 01494 483355. *Servicing, repairs, tuning, MOTs, welding, exhausts, batteries.*

M D Autocare, 54/55 Rabans Close, Aylesbury, Buckinghamshire HP19 8RS. **www.md-autocare.co.uk**

CAMBRIDGESHIRE

D.L.M. Autos, 63a Orchard Road, Great Shelford, Cambs CB22 5AA. *MOTs, servicing/repairs on modern & older cars.*

G Nice and Sons Ltd, 3 Chapel Street, Waterbeach, Cambs CB25 9HR. Tel: 01223 860241. *Isuzu specialist, MOT testing, aircon specialists.*

Kings of Witcham, The Slade, Witcham, nr Ely, Cambs CB6 2LA. Tel: 01353 778403, email: info@kingsofwitcham.co.uk. *Independent Volvo specialist since 1996.*

Saabmaster Garage Services, Unit 7, Robert Davies Court, Nuffield Road, Cambridge CB4 1TP. Tel: 01223 420055. *Independent Saab specialists.*

Swift Car Care, 145-147 St Pauls Road, Peterborough. Tel: 01733 897080.

VW Technics, Unit 10, Highgate Farm, Over Road, Willingham, Cambridge CB24 5EU. **vwspecialistcambridge.co.uk**

CHESHIRE

Andy Stockton Autocare Ltd, Unit 26, Heron Business Park, Tan House Lane, Widnes WA8 0SW. Tel: 0151 420 2838. **asautocare.co.uk** *Vauxhall specialist.*

CLEVELAND

Ron Payne & Son, Baltic Street, Hartlepool TS25 1PS. Tel: 01429 273646.

CORNWALL

Dale Brett Autos, Gilston Road, Saltash, Cornwall PL12 6TW. Tel: 01752 849448. *Family owned and run. 10/10 everytime.*

Ferris Garage Ltd, Truro TR3 6RE. Tel: 01872 862218.

M Clark Motors, Polperro Road, West Looe PL13 2QP. Tel: 01503 265511. *MOTs, servicing, welding, tracking, bodywork, exhausts, batteries.*

CUMBRIA

Cleator Moor Auto & Body Repairs Ltd, Ennerdale Road, Cleator Moor, Cumbria, CA25 5LD. Tel: 01946 811800. *Service is brilliant and the mechanics very knowledgeable.*

Riverside Garage, Holmrook, Cumbria CA19 1UH. Tel: 01946 724228. *Friendly helpful and professional service.*

Wheatsheaf Garage, Low Road, Brigham, Cockermouth CA13 0XH. Tel: 01900 825946. *Excellent service. Classics welcome, especially Minor & MGB.*

DERBYSHIRE

The Service Garage Ltd, Engineering Services, 51 Derby Road, Borrowash, Derby DE72 3HA. Tel: 01332 663982 or 677131.

Walgrove Garage Ltd, Walgrove Road, Brampton, Chesterfield, Derbyshire S40 2DS. Tel: 01246 278181. *French & VAG specialists. MOTs, tyres and welding.*

Walkers Motors Servicing & Repairs, 9 Platt Street, Padfield, Glossop SK13 1EB.

DEVON

Racecourse Garage, Babbage Road, Totnes Industrial Estate, Totnes, Devon TQ9 5JA. Tel: 01803 862297. *Offers excellent service and competitive rates.*

Tuned Auto Repairs, Newcourt Barton, Clyst Road, Topsham, Exeter EX3 0DB. *Excellent customer service at cheap rates.*

DURHAM

Skipbridge Garage, Hurworth Moor, Darlington, County Durham DL2 1QL. Tel: 01325 720498.

ESSEX

Bennetts BMW Specialists, Unit 1, Haltgate House, Hullbridge Road, South Woodham Ferrers, Chelmsford, Essex CM3 5NG. Tel: 01245 328601, **www.bennettsbmw.co.uk** *BMW specialists, also all-makes repairs.*

The Bodyshop, 31-37 Tomswood Hill, Barkingside, Essex IG6 2HL. Tel: 020 8500 9228 **bodyshop.uk.com**

D & A Autos, Unit 1A, Pools Lane, Highwood, Chelmsford, Essex CM1 3QL. Tel: 01245 248317.

Frank Shaikley and Sons, Hawkins Road, The Hythe, Colchester, Essex CO2 8JY. Tel: 01206 796657.

Halfway Garage, behind Frinton Gate Motors, Colchester Road, Tendring, Essex CO16 9AA. Tel: 01255 831285. *Service, repairs, MOTs incl motorbikes.*

Motorvation 2000, Unit 13 Stondon Road, Hallsford Bridge Industrial Estate, Ongar, Essex CM5 9RB. Tel: 01277 364241. *Engine rebuilds, MOT, servicing, electrics.*

Oakdene Autos, Cranes Close Basildon, Essex SS14 3JB. Tel: 01268 520537. **www.oakdeneautos.co.uk** *Bodywork, welding, MOT & servicing work.*

Pristine Bodyworks/RR Automotive, Scaldhurst Farm, Larkhill Road, Ashington, Essex SS4 3RU. Tel: 01702 257177. *Family run – one brother handles mechanical work, the other bodywork.*

GLOUCESTERSHIRE

Stonehouse Exhaust, Unit 1, Orchard Place, Stonehouse, Gloucestershire. Tel: 01453 822971. *Excellent garage. Good old-fashioned service!*

HAMPSHIRE

Keylink Systems Ltd, 15/16 The Calvert Centre, Woodmancott, Winchester SO21 3BN. Tel: 01256 379150. *Mercedes/BMW specialists but will take care of anything.*

SJB Autotech, Unit 3, Beresford Centre, Wade Road, Basingstoke RG24 8FA. Tel: 01256 477 411. **sjbautotech.co.uk** *Jim, the owner, is extremely experienced with the VAG range.*

Mendem Motors Ltd, Unit 4, Stacey Industrial Park, Silchester Road, Tadley RG26 3PY. Tel: 0118 970 2222. **mendemmotors.co.uk**

Wes & Co, Shootash Garage, Salisbury Road, Romsey, Hants SO51 6GA. Tel: 01794 515003. *MOT station, servicing.*

HEREFORDSHIRE

DC Rogers Auto Repairs, Unit 11, Beech Business Park, Tillington Road, Hereford HR4 9QJ. Tel: 01432 264200.

HERTFORDSHIRE

Broxbourne MOT and Motorist, Unit 1, Bridge Works, Nazing New Road, Broxbourne, Herts EN10 6SG.

KENT

Bexley Lane Garage, 33-47 Bexley Lane, Crayford DA1 4DD. Tel: 01322 527279 **bexleylanegarage.co.uk** *Lockheed Authorised Brake Safety Centre, MOTs, servicing.*

Chelsfield Motor Works, Court Lodge Farm, Warren Road, Orpington BR6 6ER. Tel: 01689 890689. *Mechanical repairs, MOTs, bodywork, aircon, diagnostics.*

Hartley Garage Services Ltd, Ash Road, Longfield DA3 8EL. Tel: 01474 706501. *All usual garage services plus MOTs/aircon.*

Ivydene Garage Ltd, Unit 99, Ellingham Way, Ellingham Ind. Est., Ashford TN23 6LZ. Tel: 01233 636081. *Mechanical repairs, servicing all makes, MOTs, aircon, Bosch diagnostics.*

LANCASHIRE

Mick's Garage, Unit 2A Old Station Yard, Kirkby Lonsdale LA6 2HP. Tel: 01524 237785. **https://micksgarage-ap.co.uk** *Proprietor Mick Gudgeon is a time-served MB tech but also works on all other makes. MOT station up to Class 7 with a 6.5m bay.*

LEICESTERSHIRE & RUTLAND

Broad Street Garage, The Old Forge, Brook St, Enderby, Leicester LE19 4ND. Tel: 0116 286 1416.

L&H Exhausts MOT & Service Centre, 4 Charlotte Street, Melton Mowbray, Leics LE13 1NA. Tel: 01664 562684. **lhexhaustsmotcentre.co.uk** *Very good independent garage.*

Tarsel Motors Ltd, 173 Church Hill Road, Thurmaston, Leicester LE4 8DH. Tel: 0116 693333.

J. T. Tilley and Son, 3 Lutterworth Road, Burbage, Hinckley, Leics LE10 2DJ. Tel: 01455 239303.

LINCOLNSHIRE

Corten Miller Performance Centre, Friskney Eaudykes, Skegness, Lincs. *Very knowledgeable highly-skilled staff.*

Derek Chapman Motor Services, 13 High Street, Alford, Lincolnshire. Tel: 01507 462571. *An excellent and friendly garage and bodyshop.*

G Harniess (Louth) Ltd, Bolingbroke Road, Fairfield Industrial Estate, Louth LN11 0WA. Tel: 01507 603341. **gharniess-louth.co.uk**

Huttoft Service Station, Mumby Road, Huttoft, Lincs LN13 9RF. Tel: 01507 490283. *Village garage with all usual repair facilities plus LPG stockists.*

W H Brand and Son, Whaplode Drove, nr Spalding, Lincs. Tel: 01406 330265. *Daewoo/Chevrolet franchise and independent MG Rover specialists.*

LONDON (GREATER)

Barnet Service & Tuning Centre, 1 Motor Way, Margaret Road, New Barnet, Herts EN4 8DW. Tel: 020 8441 6667. **www.scimitarmotorservices.co.uk** *All usual garage services plus MOT testing.*

MANCHESTER (GREATER)

Phoenix Close Honda, Unit 208 Phoenix Close Industrial Estate, Heywood OL10 2JG. Tel: 01706 366500. *Proprietor Chris assisted by Phil are both Honda trained. Mechanical & diagnostic work. Wouldn't take our CR-V anywhere else.*

MERSEYSIDE

Village Auto Repairs, 6a Greenes Road, Whiston, Prescot, Merseyside L35 3RF. Tel: 0151 426 0999. *Servicing and repair of cars & light commercials. Also a Class 4 MOT testing.*

NORFOLK

Bragg of Briston, 23A Fakenham Road, Briston, Melton Constable, Norfolk NR24 2HL. Tel 01263 860554. *Peugeot/Citroën specialist but now covering all makes.*

Herring and Palmer, Hewett Yard, Hall Road, Norwich. Tel: 01603 666585. *BMW specialists, all makes catered for.*

Threeways Garage, Watton Road, Shipham, Norfolk IP25 7PE. Tel: 01362 820430. *Independent Citroën specialist, also repairs/services other makes. MOTs.*

S & R Motors, Sunset Lodge Industrial Units, St. Germans, Kings Lynn. Tel: 01553 617696 or 07788 268121. *Run by Steve Smith. Service is excellent.*

Stone Chips Ltd, 12 Garden Street, Norwich NR1 1QU. *Minor paintwork repairs, bumpers, etc. Valeting, interior repairs, alloy refurbishment.*

NORTHAMPTONSHIRE

Rob Price Automotive Services, 146 Northampton Road, Broughton, Kettering, Northants NN14 1NS. Tel: 01536 790901.

NORTHUMBERLAND

JT Auto Services, The Old Works, Red Row, Morpeth, Northumberland NE61 5AU. Tel: 01670 761711. *Repairs, servicing.*

NOTTS

PVS (Professional Vehicle Servicing), Glaisdale Drive, Nottingham NG8 4GY. Tel: 0115 928 3333. *Repairs, servicing, reasonable prices, helpful staff.*

Wright Engineering Co Ltd, 332 Colwick Road, Nottingham NG2 4BG. Tel: 0115 950 2284. **wright-engineers.co.uk** *Automotive services including milling, turning, grinding, and fabricating.*

OXFORDSHIRE

Oxford Autogas, Tiddington Garage, Oxford Road, Tiddington. Oxon. OX9 2LH. Tel: 01844 279588. **oxfordautogas.com** *LPG installation and servicing. MOT, service and repairs.*

SHROPSHIRE

Bridgnorth Motor Services, Station Lane, Hollybush Road, Bridgnorth, Shropshire WV16 5DP. Tel: 01746 762562 or 07708 167346. *Mark is an ex-Ford mechanic and seems very experienced.*

SOMERSET

Hatley Garage, 86 Kewstoke Road, Kewstoke, Weston-super-Mare, North Somerset BS22 9YH. Tel: 01934 622495. *Specialising in classic Mini's.*

N S Autos, Prowles Cross, Yeovil, Somerset BA22 9RG. Tel: 01935 872891. **nsautos.co.uk**

STAFFORDSHIRE

Midland VW, 21 Conduit Road, Norton Canes, Cannock, Staffs WS11 9TJ. Tel: 01543 495700. **midlandvw.com**

Snows Garage (Hanley) Ltd, 706 Leek Road, Hanley, Stoke-on-Trent, Staffs ST1 4NP. Tel: 01782 215544.

Squire Automotive, Unit 2A Zone 2 Ring Road, Burntwood Business Park, Burntwood, Staffs WS7 3JQ. Tel: 01543 672247. **squireautomotive.co.uk**

SUFFOLK

Barrett-Lee Ltd, 4 Byford Road, Sudbury, Suffolk CO10 2YG. Tel: 01787 468900.

DN Autos Mobile Mechanic, based Saxmundham, Suffolk – but travels. Tel: 07895 078447. *Trustworthy bloke, reasonable prices. My family's go-to mechanic.*

SUSSEX

Coles Automotive, Browns Meadow, Edburton Road, Edburton, Henfield, West Sussex BN5 9LN. Tel: 01273 857520. **colesautomotive.co.uk** *Land Rover ralliers.*

Cradle Hill Motors, Unit 16, Cradle Hill Ind Est, Seaford, East Sussex. Tel: 01323 890737.

Rew Auto Services, Unit 13, Eastmead Industrial Estate, Lavant, Chichester, West Sussex PO18 0DB. Tel: 01243 839520.

Vasstechnik, Unit 2, Potts Marsh Est., Eastbourne Road, Westham, Pevensey, East Sussex BN24 5NH. Tel: 01323 438754. **vasstechnik.co.uk** *Servicing/repairs to VAG and MG/Rover.*

SURREY

MCM, Station Lane, Milford, Surrey GU8 5AD. Tel: 01483 424815. *VW/Audi, BMW, Mercedes – all quality car specialists.*

Elmwood Vehicles Ltd, 278 Kingston Road, Ewell, Surrey KT19 0SH. Tel: 0208 394 2847 **carservicerepairssurrey.co.uk**

TYNE & WEAR

Gavin Reed Ltd, Sunniside Garage, Front Street, Sunniside, Newcastle-Upon-Tyne NE16 5EE. Tel: 0191 488 7298.

Scotts Bank Motor Services, Scotts Bank, Southwick, Sunderland. Tel: 0191 549 7500. *Volvo-trained.*

WEST MIDLANDS

Cottage Garage, Brandon Way, West Bromwich B70 9PW. Tel: 0121 525 4413.

GW Motors, 172 Sockfield Road, Acocks Green, Birmingham B27 6AU. Tel: 0121 706 2327 or 0121 706 4770. *Family-owned and "friendly, helpful and no bullshit."*

WILTSHIRE

FJ Chalke Ltd, The Talbot Garage, Mere, near Warminster, Wiltshire BA12 6HE. Tel: 01747 860244 **www.fjchalke.co.uk**. *Kia agent, before that Austin then Rover.*

Melksham CarCare Centre, Bath Road, Melksham SN12 8DB. Tel: 01225 703014.

WORCESTERSHIRE

RK Services, Lower Leys, Evesham, Worcestershire WR11 3AB. Tel: 01386 48935. **rkservices.com**

YORKSHIRE

Hargreaves Jeep Specialists and MOT Centre, Bradford Road, Sandbeds, Keighley, West Yorks BD20 5LY. Tel: 01274 569262. **hargreavesgarage.co.uk**

Horbury Garage, 35 Westfield Road, Horbury, Wakefield WF4 6HS. Tel: 01924 265283.

Pure Car Mechanics, Westgate Carr Business Park, Westgate Carr Road, Pickering, North Yorkshire YO18 8LX. Tel: 01751 475794. **purecarmechanics.co.uk** *The garage is female-friendly.*

RTN Auto Services, 11 Waggon's Way, Stainforth, Doncaster, South Yorks. Tel: 01302 351167. *Peugeot/Citroën specialist.*

W Sykes & Son Ltd, Lower Wortley, Leeds LS12 6AB. Tel: 0113 263 9388. *MOTs, servicing and repairs. Small family garage.*

Victoria Motors, Victoria Street, Stocksbridge, Sheffield S36 1GY. **victoria-motors-stocksbridge.co.uk**

Yorkshire Vehicles 24-7, Unit 5 Sunshine Mills, Leeds LS12 3HT. Tel: 0113 318 5259. **yorkshirevehicles24-7.co.uk**

NORTHERN IRELAND

T.F. Cars (Tommy Fegan), Motor Engineers, 35-39 Parkmount Road, Antrim Rd, Belfast BT15 4EQ. Tel: 028 9037 1868. *A father and son outfit, doing mechanical and MOT work at reasonable rates.*

McKay Motor Works, 616a Antrim Road, Newtownabbey BT36 4RF. Tel: 07787 806597. *Toyota Master Technician.*

SCOTLAND

Greenend Motors, 20 Sunnybank Terrace, Lower London Road, Edinburgh EH7 5TW. Tel: 0131 661 4825.

Lewiston Garage, J A Menzies & Sons Ltd., Lewiston, Drumnadrochit, Inverness IV63 6UL. Tel: 01456 450212. *Good village garage, MOTs. Excellent and helpful.*

Lothian Motors, 68 Lothian Street, Bonnyrigg, Midlothian EH19 3AQ. Tel: 0131 663 1076. *Family-run, electronic and aircon repairs, servicing and MOT.*

Sutherland Arms Garage, Victoria Road, Brora, Sutherland KW9 6QN. Tel: 01408 621721. *Vauxhall specialist, MOTs, aircon and servicing to all makes.*

The Garage (Wishaw) Ltd, 70A Elison Court, Motherwell, Scotland ML1 2DN. Tel: 01698 265303. *Japanese performance specialist, MOTs. Excellent diagnostics.*

WALES

MB Motors, Cowbridge Road, Brynsadler, Pontyclun, Mid Glamorgan CF72 9BT. Tel: 01443 229522.

The Olde Pounde Garage, Penperlleni near Pontypool. Tel: 01873 880312. *MOTs, plus general repairs/maintenance.*

Three Arches Services Ltd, Heathwood Road, Cardiff CF14 4HT. Tel: 02920 752101.

AJ Autos, 2a Gaskell Street, Newport, Gwent NP19 0GH. Tel: 01633 250513.

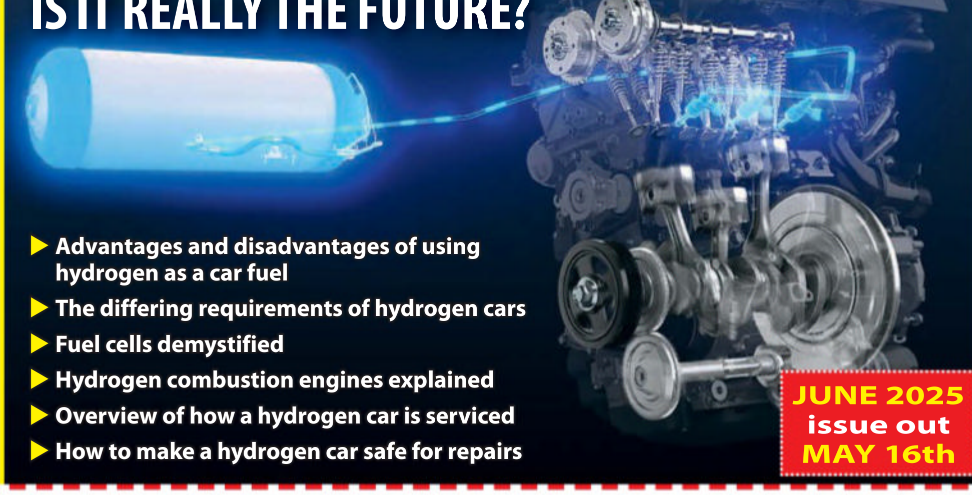
IRELAND

Harkin's Garage, Gleneely, nr Carndonagh, Co Donegal, Ireland.

NEXT MONTH

HYDROGEN

IS IT REALLY THE FUTURE?



- ▶ Advantages and disadvantages of using hydrogen as a car fuel
- ▶ The differing requirements of hydrogen cars
- ▶ Fuel cells demystified
- ▶ Hydrogen combustion engines explained
- ▶ Overview of how a hydrogen car is serviced
- ▶ How to make a hydrogen car safe for repairs

JUNE 2025 issue out MAY 16th

Exhaust Troubles

- ● PROJECT MX-5 NEW BILSTEIN DAMPERS
- ● BUYING A MERCEDES-BENZ B-CLASS
- ● VW BEETLE 2.0 DIAGNOSTICS
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EMAIL: martyn.knowles@kelsey.co.uk

CARS FOR SALE

EX-*CM* 2010 Mk4 FORD MONDEO 2.0 TDCi TITANIUM. As seen in the February-July 2023 issues of *Car Mechanics*, and now owned by contributor Rob Hawkins. 139k, with an MOT until 19th March 2026 and has recently been serviced (oil & filters) including a full strip and clean of the brakes. As a project car, it had a new clutch, turbo and aircon condenser fitted in 2023. Several suspension components were changed along with the timing belt (next due in 2033). Despite having the front bumper painted to remove scuff marks, Rob admits he's added a few blemishes to the rear, but there are no cracks in the bumper and all of the parking sensors (front and rear) work. A pair of Mondeo-specific removable roof bars are included, which have proved useful for carrying a roof box and a kayak. The 2-litre turbodiesel engine pulls like a train and returns around 45mpg. The six-speed manual gearbox is perfect for cruising along the motorway at low rpm. This Mondeo has proved to be a reliable daily workhorse for over two years, but as with any car that's not brand-new, Rob can't guarantee trouble-free miles forever. If you're interested in taking it on, the price tag is **£1595**. **07932 190756**. Yorkshire.

KIA RIO. 2013. 1.4 petrol, 5-door. Drives very nicely. Alloys, electric windows and aircon. Serviced this week at 71,000 miles, with a new Start-Stop battery and 12 months MOT. Comes with a new mat set and eight stamps in the service book, original handbooks and invoices. **£2500** ono. **01252 612476**. Hampshire.

DAIMLER SUPER V8 LWB. 1998. One owner for last 23 years. MOT May 2025. FSH. Mileage 158,000. Excellent bodywork and mechanics – new battery recently installed. Don't be put off by mileage, it drives beautifully. **£1900**. **01442 86587**. Herts.

MISC

NUMBERPLATE FOR SALE – DAD 792. **£1495** or best offer. **07824 507475**.

PARTS FOR SALE

LASER
LASER
NEILSEN

TIMING TOOLS for Renault diesel, Rover K-Series, Volkswagen diesel. **£25**. **07850 319707**. Liverpool.

VW GOLF Mk6 PARTS. 2009-2012. **1.6 FSI** service items – oil/air/pollen filters, etc. **2.0 GTI** (4-door model) parts as follows: front struts/coil springs/wheel bearing housings/front hubs. Nearside front door (complete, no rust). Rear wheel bearing/transverse links/trailing arms/shock/coil springs. Brake discs/calipers. All parts intended for rebuild of project car. **£150** to clear. **07856 284613** for further info. Essex.

FORD PARTS. 1980-1999. Escort, Fiesta, Puma Mk1 – starter motors, shocks, brake calipers, cambelt kits, oil filters, wiper blades. All parts new or clean condition. **£150** to clear. **07856 284613** for further info.

WANTED

TOOL CHEST. I'm after a tool chest, ideally on roller wheels and around 2m in length minimum so I can use it as a bit of a workbench. Here is a link to an SGS item which is the kind of thing I'm after **https://www.sgs-engineering.com/stcbb7200-sgs-72-15-drawer-tool-chest**. **07535 670208**. North Yorkshire.

NEW TOYOTA AYGO PARTS: Genuine parts for Aygo 2017 range as follows: 5 litres 0W/20 AFE Extra Oil. Oil filter + sump washer (90915-YZZM3). Spark plugs x 3 (SC16HR11 IRIDIUM). Price for complete package including P&P. **£90**. **07845 785420.** Angus.

JAGUAR XF or XE REAR PADS. And Land Rover Disco. Blue Print ADJ134251. **£15**. **07850 319707**. Liverpool.

ROVER 214. 1991. Set front brake pads/discs, shoes, rear shock absorbers, driver's side door sill panel + some other parts. All new. **07707 540061** for details. Co Down.

CLASSIFIED DEADLINE for JUNE 2025 issue: May 29th

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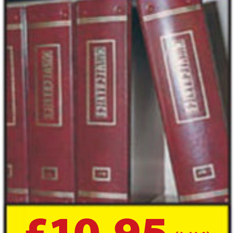

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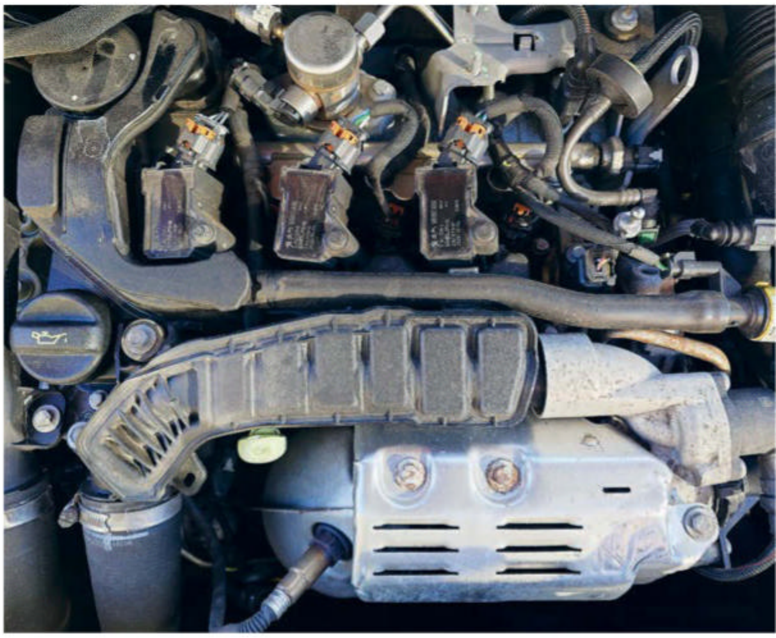
In my Humble Opinion

Mike Humble luckily dodges a bullet but ponders over modern design.

PureTech and other wet belt engines – pure genius or pure junk?



▶ Engine design is something we have touched upon many times before at *CM*. However, you can only reinvent the wheel to a certain degree no matter how hard engineers try to. Certain designs have proven to be either extravagant, complicated or plain old problematic in service. Rotary or Wankel (stop sniggering at the back) designs never really offered anything more than a great engine note and a saving in weight. Overall, they were thirsty, used plenty of engine oil and if not fastidiously looked after – wore out at very low mileages. Boxer engines again sound fantastic but generally lack torque and don't offer any real advantage over traditional designs when it comes to practice. Despite the 'eco' obsession doing its best to knacker our motoring enjoyment, current petrol or diesel engines still operate at their best with its cylinders in a row or in a 'V' shape – perfection cannot be improved upon.

Many of us are sure to recall those legendary overhead valve petrol engines such as Leyland's A- or B-series, not to mention the good old Ford Crossflow latter 'Valencia' units with their valve gear operated by chains, pushrods and rockers. Made of pig iron and good for untold abuse, happy to run on the nastiest of cheap engine oil and could be stripped down and rebuilt on a Saturday using little more than a big hammer and an egg whisk – all done just in time for a quick spin round the block and clean up in time for the final results on Grandstand. Then came the dreaded timing belt and all its overhead cam frivolities. Slant head Vauxhall 1800 or 2300 and Ford CVH units often failed at stupidly early intervals until better engineering was designed into the production line.

Well, I think we have gone backwards. Just look at how common modern motors go on the blink since the re-introduction of the timing chain. It's not just mainstream cars either, even many so-called prestige German brands are having a right problem too. You see, engine production is all about cost, and if a manufacturer can get away with a timing chain guide made of marzipan instead of metal to save two bob per unit, then they will – and mark my words they do. But best of all, who the blinking flip thought running a timing belt internally bathed in engine oil was a good idea? My Vauxhall Grandland X for example, has the PSA designed 1.2 three-cylinder turbo engine they call the 'PureTech', or as some fitters will call 'Puresh*te'. Apart from the wet belt idea though, it's a little bobby-dazzler of an engine.

It pulls from its boots, which is amazing for the size and number of cylinders, is barely audible at motorway speeds thanks to the top gear being even longer legged than Maci Currin. Fuel consumption remains in the fifties when cruising and normal routine servicing procedures such as lube, filters, plugs and so on are a DIY treat – it's such a simple thing to work on, but there's a catch. It has that bloody wet belt engine design and in my opinion despite having a real winner of an engine on paper, the wet belt idea has turned it into a modern-day Rover K-series. When you trawl the forum pages for anything Citroën, Peugeot or Vauxhall you read the same horror stories of belts failing or decomposing to the extent that it starts to shred and debris blocks the oil pick up strainer causing a loss of oil pressure.

Having spoken to numerous mechanics about this both at dealer and back street level, it seems that pilot error causes a great deal of the heartache. The correct type of engine oil is CRITICAL for this engine design and contains a magical recipe of additives that repel the degradation of the timing belt. Not servicing the engine either at all or too late causes a rapid deterioration of the belt structure – check your oil on these and if it's black on the dipstick, you've got a four-wheeled time bomb on your hands. I've been (touches wood) lucky with mine, it came from a good home and has been serviced within an inch of its life properly too, but I did have a minor scare recently when it went into limp-mode and warned me of low oil pressure.

Fearing the worst, I went to remove the sump only to find it was so well sealed onto the bottom of the engine block as there's no gasket, the sump pretty much had to be hammered and prised off. A short while later the battered and mullered sump came off only to find a virtually clean strainer. Removing the sump, however, is a simple task – just a wiggly row of 8mm bolts hold it on. Like I said, apart from the avoidable Achilles heel, it's a cracker of an engine. A new sump, a filter, a tube of anaerobic sealant and a new oil pressure switch (the actual cause) along with some 0W-20 PSA-approved engine oil relieved me of almost £200 but at least I'd been lucky compared to some. What made it especially annoying though was the fact that barely two months earlier I had serviced the car and replaced the front brakes, so the oil and filter that was drained off and disposed of was still as fresh as a daisy.

We bang on about these things time and time again. Most of the usual car troubles can be avoided by simply doing things properly and by the book. We all hate spending money of course but sometimes you have to speculate to accumulate as the saying goes. A perfectly fettled and serviced car is a reliable car on the whole, but there again, I shouldn't need to tell you that should I?

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